

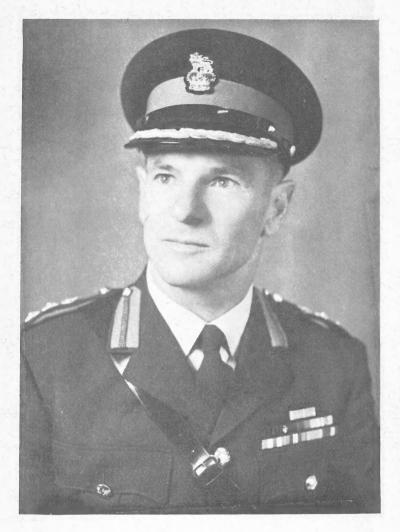
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The Author

## DON'T DIE IN THE BUNDU

# COLONEL D. H. GRAINGER, O.B.E., E.D. RHODESIA ARMY

Bundu—the veld, the open space, the Rhodesian bush (corruption of bundo (Shona)—grasslands)

HOWARD TIMMINS

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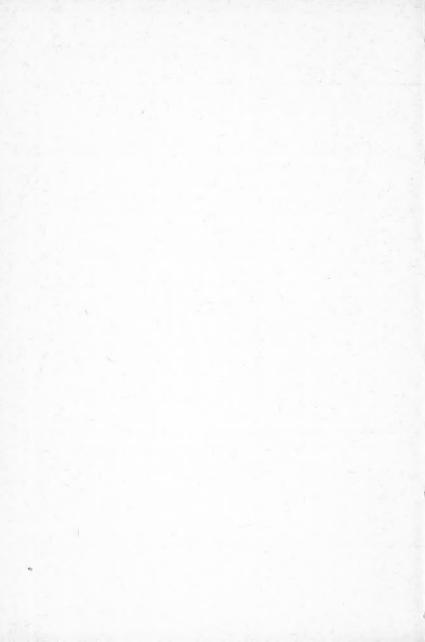
10th Edition

#### ACKNOWLEDGEMENTS

This book had its origin in the requirement of the Rhodesian Forces for a concise book on bushcraft, couched in simple terms.

Despite my many years in Rhodesia. I am very much an amateur in bushcraft matters. There are experts in all the various fields covered, any of whom could have produced a better book. My excuses for writing it are my interest in and love of everything that grows, crawls, walks, swims or flies in the bundu and the many assurances I have received that such a book is long overdue.

I have been most fortunate in obtaining advice and constructive criticism from recognised experts in both the scientific and practical fields and I gratefully acknowledge the help given by Mr. G. L. Guy, who provided the initial spur, by Mr. R. H. N. Smithers, Mr. D. G. Broadley and the staff of the National Museums, Dr. H. Wild, Mr. R. B. Drummond and the staff of the Government Herbarium, Salisbury, Mr. E. Davison, Capts. G. A. Lloyd and S. A. Kock and Lt. C. R. Savory of the Rhodesia Army; my special thanks are also due to Mr. Colin Black for his advice on authorship, to Mrs. Dawn Andrew and Mrs. Toni Hume, whose delightful illustrations have brought the pages to life, and to Mr. Howard Timmins for making available the coloured plates from "Poisonous Snakes of Southern Africa".



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Wherever possible the Afrikaans and vernacular names of plants, snakes, etc., have been included. Ndebele, Shona and Manyika names are indicated by (N), (S) and (M) respectively.



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#### FOREWORD

BY THE RT. HON. SIR HUGH BEADLE, C.M.G., O.B.E.

Chief Justice of Rhodesia Chairman of the Rhodesia National Hunters' and Game Preservation Association

"Don't Die in the Bundu" is a handbook of survival techniques which are based on many years' experience of men who have lived—and some who have died—in the bush. Above all, it is based on common sense.

Men still get lost—and hurt—in the bush in this Twentieth Century. "Don't Die in the Bundu" has been written primarily for the soldier, the airman and the policeman, whose duties often take them into the bush. The book is aimed at supplementing the knowledge they acquire in their basic training and specialised exercises, but this book will also prove of great value to all those whose work, hobbies or recreation take them into the bush—the land surveyors, the contractors, the members of the National Park staff and the hunters. Organisations such as Outward Bound and youth organisations such as the Boy Scouts, whose members often spend much of their time in the bush, will also find much of interest in its pages.

The aeroplane has revolutionised speedy travel but it has also created a new hazard—the hazard of a forced landing in the bush, exposing people wholly unfamiliar with the bush to dangers to which they would otherwise never have been exposed. To aircraft pilots, particularly those who pilot small aircraft on unchartered flights across our trackless bush and for whom the risk of a forced landing in the bush must always

exist, this book must prove particularly valuable.

Jeffrey Farnol said:

He who a great good thing would know, Must to the silent places go.

Many townsmen with no knowledge of our bush fear it, and fearing it, they avoid it. They thus never know the "great good thing" of our "silent places". They never know that they are losing something which Rhodesia with her vast wilderness areas is so well fitted to give. The townsman who is afraid of the bush should read this book, and reading it he will learn how groundless his fear really is. Losing his fear, he may well be tempted to explore our silent places and, when he does, again to quote Jeffrey Farnol:

There the good Lord grant that he, Has ears to hear and eyes to see.

If this book and the good Lord then grant him the "ears to hear" and the "eyes to see", he will have learnt the "great good thing" of our "silent places" and he will be ever grateful to the author, not simply for showing him how not to die in the bundu but for showing him the way to the "great good thing" which only the bundu can give.

I therefore commend this book to every Rhodesian.

HUGH BEADLE

Salisbury, 1 March, 1967

#### "CRASH LANDING"

In the scorching noon heat of the Zambezi Valley, no man or beast stirred. Trained by nature and experience to conserve energy during the hot hours, they sheltered under thatched roof or tall tree from a searing sun which seemed to shrivel all vegetation.

A mile in the sky a dozen tiny dots floated in circles, a flock of vultures riding the thermals as they scanned the bush with their telescopic eyes, ever watchful for any animal in distress.

An explosion of smoke hung in the haze over a small clearing in the thorn thickets. Scattered in violent disarray were the wings, undercarriage and broken fuselage of a twin-engined aircraft from which a burning engine had broken free.

The vultures came lower.

Fifty yards away a man stumbled from the long grass on to a game trail. He paused, then walked slowly down the trail, holding his side where his ribs had been bruised by the aircraft frame as he had tried to land in the little clearing with the engine on fire. Blood dripped steadily from a deep cut in one forearm. Hatless, with his shirt and shorts torn ragged by the crash, he tried to quicken his pace as his mouth grew drier and drier in the throbbing heat. Dazed, shocked by the crash, he did not see the many animal tracks along the trail.

"Water," he thought, "I must find water" . . .

The trail forked. The man turned half-left, on to the narrower trail. The animal tracks continued along the right fork.

For ten minutes the man stumbled along, then stopped in the shade of a great tree. Holding on to the trunk, he looked back. He could not remember in which direction the aircraft wreckage lay. Perhaps he should have waited where he had crashed. Searchers would undoubtedly spot the wreck from the air. He turned to retrace his steps.

In the path in front of him stood a bull elephant, vast and menacing as an Army tank . . .

#### CHAPTER I

#### THE EMERGENCY

The Rhodesian bundu has a fascination for those whose way of life is wrapped up in it, such as soldiers, policemen, game and tsetse fly rangers and farmers. All find it a most rewarding study.

Few Rhodesians, however, can isolate themselves from the bundu, although many avoid too close contact with it from dislike of discomfort, fear of the unknown—and some doubt about their own weaknesses. These dislikes and doubts can be overcome by a knowledge of the geography of the country, its flora and fauna, and of simple bushcraft.

In a country like Rhodesia, with its vast areas of undeveloped bundu, there is always a possibility of a survival situation arising from an aircraft accident, car breakdown, or an individual losing touch with the main body of a hunting or camp-

ing expedition, thinking to walk to the nearest river or kraal, becoming confused and alarmed . . .

Such a situation calls for calmness, confidence and, above all, the will to survive. The major problem is not a physical but a mental one. If you are not expecting to be faced with a survival problem, clearly you must adjust your thinking to the situation.

This book is an outline of the information you need to reduce initial fears and give you self-confidence. It tells how to find water and food, to make yourself confortable and to render first aid; that calmness, confidence, self-discipline and forethought are more important than strength in survival effort and that previous knowledge, coupled with common sense, can make the bundu almost as familiar as your city, town or village park. All those whose work brings them into contact with the bundu know that bushcraft is a practical subject and that practice in the field is essential if the skills are to become automatic.

What was contained in the vehicle or aircraft, or is carried on your person, together with the rich resources of the bundu, are all you need to survive if you absorb the short lessons of this book and have the will to survive.

Survival starts from the aircraft emergency, from the moment you realise you are cut off from your party, or from the time that a patrol knows that the time of re-supply from base is uncertain.

In fact, in the case of an aircraft pilot, survival procedures commence before flight, in the trained appreciation that an aircraft is heavier than air and that accidents are therefore possible. Thorough and correct flight planning and strict adherence to the flight plan can make all the difference in the event of a crash or bale-out. It is most important to pocket pride and get in touch with flight control if you are in any doubt as to your whereabouts or in any predicament while still in the air.

Try to maintain height, and with it the best radio range. If you are in difficulties over what is possibly an uninhabited area, head as quickly as you can towards a populated one. If you have no alternative but to bale out, your survival problems are increased because you will have less water, food and equipment—and will be alone.

Make sure that you know your emergency drills thoroughly. Taking—or not taking—the right action may decide whether you live—or die. Mild shock frequently follows a crashlanding or bale-out and may cause irrational behaviour, as will panic in a man lost or cut off from his party. Training in emergency procedures can make these automatic even if the survivor is in a dazed state.

If your aircraft has crashed, the first thing to do is to get yourself and as much of your kit as possible out of the plane—and a safe distance away from it, in case of fire or explosion. Check for injuries, deal with them and, if necessary, build a shelter of some sort.

Now sit back and rest for an hour or two. Give yourself the

opportunity to recover from shock, and to take stock of your-self and your surroundings. This applies to the early stages of any survival situation, whether it has arisen because of an accident or simply because you are lost.

Calmness and a confident appraisal of your next moves are vital. You have to decide whether to remain where you are and wait for rescue, or to move. Unless you are in thick forest, the best plan is to stay where you are or, in the case of a crashed plane which is easily recognisable from the air, to base yourself near it.

If you decide to wait, set out an appropriate signal of the International Ground/Air Emergency Code and try to improvise a heliograph mirror, which is easily the best method of signalling to a searching aircraft.

Organise your camp. If there are more than one of you and there is no definite leader, appoint one, let him take charge—

and do what he says.

Now look for a source of water and for food. If you don't eat and drink, you will in time die.

#### CHAPTER II

#### OUTLINE OF FIRST AID

In peacetime, as in wartime, a wounded man is more difficult to handle than a dead one.

It is essential that every man on patrol or operations should understand the basic methods of first aid to the injured and the principles of preventive medicine.

This applies especially to leaders, who are responsible for the health of their men.

The principles and practice of first aid are based on the principles of preventive medicine and surgery, and an adequate knowledge of them enables persons to give enough assistance in case of accident or sudden illness to preserve life, prevent any worsening of the condition and help recovery before a doctor's help can be obtained. So first aid simply means treatment on the spot before the patient sees a doctor.

Thousands of men and women have been saved from death or disability because first aid was rendered, but many have died because their companions lacked the confidence or knowledge to apply it.

Three things kill:

- a) Stoppage of breathing.
- b) Bleeding.
- c) Shock.

To be able to give adequate treatment, you need:

- i) a basic knowledge of the body and its functions.
- ii) to keep calm and think.
- iii) to use your common sense—and act accordingly.

The main principles of first aid are:

a) Get your priorities right and deal calmly with the most important things first.

b) Give artificial respiration immediately if breathing has stopped.

c) Stop any bleeding.

d) Guard against or treat for shock by moving the casualty as little as possible and handling him gently; keep him warm but not hot.

e) Reassure the casualty and any companions.

f) Get the casualty to a doctor as soon as possible.

You need no fancy equipment to apply these principles. You can improvise most of what you need to treat an injury. A handkerchief makes a useful dressing and a flat piece of wood a first-class splint. You can make an effective stretcher by turning the sleeves of coats and even strong shirts inside out, passing two long, straight branches through them, then buttoning up the coat and shirt.

This book does not duplicate the comprehensive information on the structure and functions of the body which is contained in such publications as the manuals of the St. John Ambulance Association and Red Cross Society and the Army pamphlet on elements of first aid, any of which are recommended

reading.

Below are listed some of the conditions you may have to deal with.

Unconsciousness—An unconscious man is in a state resembling sleep, which may result from shock, a blow on the head, drowning, excessive heat and many other causes. If he is breathing, turn the casualty into a three-quarter prone position, left side and head supported slightly off the ground, with mouth and nose clear. This will keep the tongue from falling into the throat and stop vomit from causing choking. If the patient has false teeth, remove them. Loosen his clothing above the neck and waist and make him comfortable. Do not try to give him anything to drink. Get him to a doctor or hospital as soon as possible. If his breathing stops, apply artificial respiration.

Artificial Respiration-A half-drowned man taken from the

water may seem to be dead; he may not be breathing and you may not be able to feel a pulse. But unless he is quite stiff you must try to revive him. Remember that every second counts.

For preference, always use the Mouth-to-mouth or Mouth-to-nose methods of resuscitation. These are the least tiring, they can be used in some difficult situations, and they give the opportunity of watching the degree of inflation of the chest. Should an injury to mouth or face or some other reason make this impossible, the Holger Nielsen method is recommended. Always see that there is no obstruction in the mouth or throat.

In the Mouth-to-mouth method, take up the position most convenient to the casualty and yourself, either standing, kneeling or lying but working from the side. With the casualty on his back, hold his head in both hands, one hand pressing the head backwards and the other pushing the lower jaw upwards and forwards. Open your mouth, take a deep breath and seal your lips round the casualty's mouth while obstructing his nostrils with your cheek or closing them with your fingers. Blow into his lungs and watch for the chest to rise, then remove your mouth. Inflations should be at the rate of ten a minute, but the first six should be given as quickly as possible. Repeat until the casualty recovers.



Should you find it impossible to open the casualty's mouth or if he has no teeth, it may be necessary to use the Mouth-to-nose method. In this case, open your mouth wide, take a deep breath and seal your lips widely on the casualty's face round his nose, making sure that you do not obstruct his nostrils. Close his mouth by placing your thumb on his lower lip. If the head is insufficiently extended, the soft palate may prevent expiration by the casualty. If this happens, part his lips with your thumb after each inflation.

Should both these methods fail, check again that there is no obstruction in the mouth or throat. If there is, remove it and restart inflation. To remove an obstruction in the throat, turn the casualty on his side and strike three or four sharp blows between the shoulders; feel with your fingers whether any

debris has come into the throat.

To revive an apparently drowned man by the Holger Nielsen method, lay him on his back with something under his shoulders to raise them and allow his head to fall backwards. The head should be a little lower than the trunk. Kneel at the casualty's head and grasp his arms at the wrists. Cross them and press them firmly over the lower chest, forcing air out of his lungs.

Release the pressure and pull his arms, with a sweeping movement, upwards and outwards above his head and backwards as far as possible. This will draw air into his lungs.

Repeat about 12 times a minute, allowing two seconds for each pressure and three for each arm lift. There is danger of the casualty breathing in vomit, mucus or blood. This can be reduced by keeping his head extended and lower than the trunk. Check frequently for and remove any obstruction.

Bleeding—In some degree, this accompanies all wounds, and a man can bleed to death very quickly. Act promptly. Grazes and small cuts soon stop bleeding and you need only apply a dry dressing. A deeper cut will continue to bleed. To stop it, or slow it, raise the injured part, then apply a

dressing in the form of a clean cloth or handkerchief. Press it on firmly and bandage it in place but not too tightly. Bleeding can be stopped by a firm pressure applied on to the wound and dressing, which acts as a splint and helps immobilize the injured part. If the bleeding continues, press on the nearest pressure point, (See page 23).

After 20 minutes, stop pressing. The bleeding may by then have stopped. As a last resort, apply a tourniquet, which

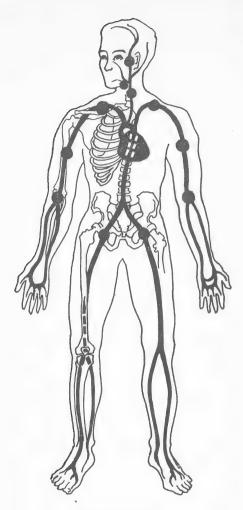
should similarly be released every 20 minutes.

Abdominal Wounds—These should be treated with the utmost urgency. Raise the casualty's knees and cover the wound and any protruding entrails with a dressing. Do not give him anything to drink (though you may moisten his lips). Do your utmost to get him to medical aid as soon as possible.

Chest Wounds—A small perforating wound of the chest only needs a dressing. A larger wound, resulting in air being sucked into the chest, should be plugged with any dressing you can find, or preferably sealed with an adhesive plaster. Don't give the casualty anything to drink, and move him, in the position in which he feels most comfortable, to medical aid.

Shock—Any injury produces shock to a greater or lesser degree. This lowers vitality and may by itself kill the casualty. The condition is recognisable in a casualty by his cold and clammy appearance and a pulse which is slow at first but later rapid and faint. He looks frightened and may shiver. Reassurance in your manner and method of handling his injuries can reduce this. Ensure that there is no further danger to him, then immobilize and rest him in a comfortable position. Protect him from the weather and soften his resting place. Give him a hot drink but no alcohol.

Broken Jawbone or Skull—A man with a head injury may be unconscious and this calls for special treatment. The impact of a blow may cause temporary loss of vision. One sign may be a trickle of blood from the nose, ear or mouth and the eyes may be bloodshot. Sometimes a large bruise may develop behind the ear. In the case of a broken lower jawbone, there will be



Pressure Points

a swelling over the break and the casualty will have difficulty in moving his jaw. There will be bleeding from the gums, teeth may be irregular, he may find difficulty in swallowing and he may dribble blood and saliva.

If the tongue has fallen back, pull it forward with a handkerchief. Support the casualty's jaw with a bandage tied over his head. If possible walk him to medical aid with his head down; if he cannot walk, lay him face down on a stretcher with his head projecting beyond the canvas, forehead supported by a bandage sling between the stretcher handles.

Broken Bones—A broken bone is a painful injury causing shock. The signs and symptoms of a broken bone are usually an inability on the part of the casualty to move the injured part, pain at the seat of the injury, deformity and swelling, and sometimes the fractured ends may protrude through the skin.

Be very gentle in handling broken bones. Relieve the pain, and with it the shock, by good treatment. Support the broken bone and stop the broken ends moving around. This is best done by supporting and immobilising the limb with a padded splint. The limb should be placed in its most natural position. Don't try to push back any bone you see protruding through the skin but apply a dressing.

Broken Collar Bone, Arm, Hand or Finger—All these bones can be broken by a direct blow or by falling on the outstretched hand. Use or improvise a triangular bandage and put the injured arm in a sling, ensuring that the position is comfortable.

Broken Ribs—These may be broken by a blow on the chest. The arm on the injured side should be placed in a sling. If the casualty coughs up blood, he should be kept in a sitting position.

Injured Spine—The backbone may be broken or dislocated by a fall from a height or a heavy blow on neck or back. Sometimes the arms and legs are paralysed below the level of the injury. If you can possibly avoid it, do not move a man whose back you think is broken. Reassure him—and get medical aid.

Broken Thighbone—A broken thighbone can be caused both by awkward falls and in vehicle accidents, is often accompanied by great shock and sometimes internal bleeding. Shortening of the leg may be noticed. Place padding between ankles and knees and secure the two limbs together, moving the uninjured leg towards the broken one. Pull the ankle gently downwards and tie the ankles together. Put a long piece of wood from heel to armpit on the injured side and tie both legs and body to the wood with bandages at ankles, knees, thighs and chest.

Broken Leg Bones—Leg bones may be broken by direct blows. Also, if the ankle is twisted, the lower bones which form part of it are often broken. Place padding between ankles and knees and tie the legs together at the ankles. Find a piece of wood long enough to reach from the ankle to above the knee and tie this outside the broken leg, tying both legs to the wood with bandages at the ankle, above and below the break and above the knee.

Burns and Scalds—Burns are caused by dry heat (usually fire), scalds by wet heat (such as boiling water). For either, treat for shock, immobilize and elevate the affected area and cover the burn or scald with a clean, dry dressing. Do not apply any lotion or oil, and avoid handling the area. Frequent drinks to which salt has been added will alleviate the pain.

Insect Bites and Stings—Insect bites often cause a swelling, they irritate and they can become septic. Dab on a little anti-septic if you have it. Toothpaste, it may be noted, eases the

pain of bee-stings.

Heat Exhaustion and Heat Stroke—Both conditions are caused by exposure to excessive heat where it is difficult to get rid of body heat by sweating. Lack of fluid and salt, fatigue—and low morale—are contributory causes.

The symptoms of heat exhaustion are headache, dizziness, muscle and abdominal cramps, and unconsciousness. In heat stroke, unconsciousness may come more rapidly but may be preceded by headache, irritability and vomiting. The face is flushed and the skin hot and dry, and the sufferer may look

as though he has influenza. The casualty should stop walking and rest in the shade. He should be stripped and sprinkled with water, fanned dry to create an artificial sweat and given cool, salted water to drink.

Snakebite—Calm and reassure the casualty. Don't allow him to walk; make him lie down and keep still. If you, yourself

are the casualty walk, never run, for help.

If you identify the snake as one of the mambas or as a Gaboon Viper, inject all available anti-venene into the casualty's muscles immediately. In any event if, as is probable in the bundu, treatment by a doctor within an hour is unlikely, commence treatment without delay.

Never use a ligature if the casualty has been bitten by an adder. If the culprit is a mamba or one of the cobras (including the Spitting Cobra and Ringhals), improvise a ligature from a handkerchief or strip of cloth and apply above the site of the bite. Several broad ligatures are better than a single narrow one; apply one above the site of the bite, and the others higher up on the affected limb. Tight ligatures are not only unnecessary but dangerous; venom is not diffused in the blood vessels and the areas deprived of blood may become gangrenous. The ligature is too tight if a weak pulse is not discernible below the point of application, or if the affected part becomes cold or bluish. All ligatures must be released for half a minute every 20 minutes and in any case discarded once anti-venene has been injected or if, after three hours, the casualty has developed no symptoms.

Incisions to remove the venom are of very doubtful value and carry a grave risk of severing veins, tendons and nerves. Potassium permanganate is a useful oxidising agent if brought into contact with the venom while this is still in high concentration but its use, especially after any delay, is not recommended due to its cauterising action, which destroys the tissues

when applied in crystal form or in strong solution.

If you have a snakebite outfit, read the instructions on the preparation and filling of the syringe and on injecting the antivenene. In the case of an adder bite, the anti-venene should be injected beneath the skin in several places surrounding the bite; do not inject too much in any one place and do not inject into fingers, toes or swollen areas. The remaining anti-venene should be injected into the muscles of both buttocks. If the casualty has been bitten by a mamba or cobra, and less than 15 minutes have elapsed, treat as for an adder bite. If more than 15 minutes have passed or, in the case of an adder bite, if there is very marked swelling surrounding it, inject all the serum into the buttocks, half into each.

Splint and elevate the affected limb if possible, and prevent any unnecessary movement of it. Give the casualty plenty of fluids, preferably containing salt and plenty of sugar. Early attention by a doctor is vital.

Embedded Fish Hook—If a fish hook is embedded so deeply that the barb is below the skin, never try to pull it out. Instead,

cut off the eye and push the hook through.

Sap or Foreign Body in the Eye—Should you get sap from the euphorbia (candelabra) tree or rubber hedge in your eye, it can cause serious inflammation. Neutralise it by bathing the eye with milk, water or even urine. A foreign body in the eye should be removed with the moistened corner of a clean hand-kerchief. If you cannot see the foreign body, get the casualty to blink his eyelids under water or lift the upper lid forward, push the lower lid beneath it and let both go. If the foreign body is embedded in the eye, do not try to remove it but get the casualty to close his eyelids. Apply a padded cloth and secure it with a bandage.

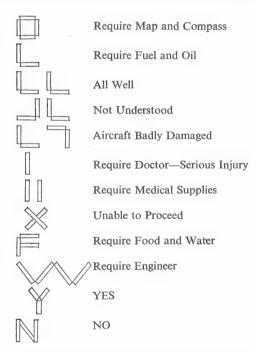
#### CHAPTER III

#### SIGNALLING TO AIRCRAFT

In the first case, rescue might come from the air.

Try to find a relatively flat, clear patch of ground about 50 by 100 feet in area, not surrounded by high vegetation and as close as possible to your camp, on which to set out a suitable signal from the International Ground/Air Emergency Code.

Panels should be at least 12 feet long by two feet wide and,

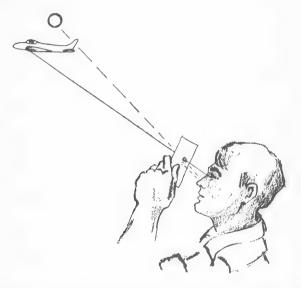


International Ground/Air Emergency Code

if possible, of a colour contrasting with the background. They can be improvised from any flexible material or from wood, stones or other material laid on the ground or by scraping or discipate their cutting in the property.

digging their outline in the ground.

If you have no ground/air radio, the best method of attracting the attention of a searching aircraft is the heliograph mirror. The Army supplies a stainless steel mirror to every Infantry section—which is all very well if you happen to be a soldier! However you can improvise one by punching a hole in the lid of a tin.



To signal, sight the aircraft through the hole, the mirror or tin lid being held a few inches from the face. A spot of light will be thrown through the hole on to the face, hand or shirt which will be visible in the polished rear of the mirror. Adjust the angle of the mirror until the spot disappears through the hole while you are sighting on the plane. In the dry season,

when grass fires cast a haze, the flash of the mirror may be seen from the air before you can actually see the aircraft, so flash the mirror in the general direction of the sound of the plane. At night, signal with a torch or, if you have crash-landed, remove, extend and use the landing-lights of your aircraft—but be careful not to flatten the battery if your radio is still usable.

#### CHAPTER IV

#### SHELTER, FIRE AND WEAPONS

Finding a suitable place to sleep or camp is not as easy as you may think. If you are on an Army patrol, tactical considerations are paramount and your base will be selected with due regard to communications, water and cover. However, when you are lost, tactics will take second place to survival.

Use your common sense and pick a camp site carefully; try to pick one close to your panel code display which, if you have crash-landed, should be as close to the aircraft as possible. Choose an area protected from the wind but avoid valleys, which can be cold at any time and are subject to frost in the winter.

Don't camp in stream beds or too close to rivers, which can rise very suddenly during the rains and in any case produce a chill ground fog.

Don't camp near anthills, which often harbour snakes. Although many trees give good shade, avoid fig trees where small flies and other insects teem in their thousands and those beneath which are indications that game use them for food or shade. Among these are two of the acacia species, also the marula (Sclerocarya caffra), described at Appendix II, and a fairly common, medium-sized tree of the Zambezi system, Balanites aegyptiaca—umLendhovu (N), muTambanto (S). This has a reticulated, grey-brown bark and green branches with strong spines; the stalked, alternate leaves have two leaflets, each roughly oblong, rounded, evergreen and up to two inches long by an inch and a half in width; the small, greenishyellow flowers appear in clusters of several to the cluster; the oily, fleshy, stoned fruits are relished by elephant. Of the acacias, Acacia albida-white thorn, umPumpu (N), muUnga (S)—is a large tree, common in Matabeleland and the lowveld, with whitish bark, silvery twigs and straight spines; leaves are

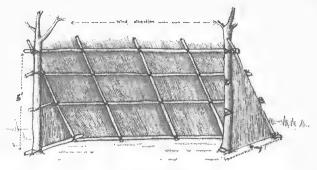
divided feather-like into four to six pairs of primary divisions, each bearing about 12 pairs of sometimes hairy leaflets; flowers are white, in cylindrical spikes; pods are grey, curved and flattened. Acacia giraffae-umFola, umHohlo-is a Matabeleland tree with strong, grevish-brown spines; leaves are feathered into one to three pairs of primary divisions, each bearing 15-18 pairs of leaflets; the thick, broad, grey pod is velvety to the touch. The tree comes into leaf early in September, sometimes providing the only shade in an area, so attracting elephant. The seed pods of both species of acacia ripen and fall from July to October and are much sought after by elephant, rhino, buffalo and cattle.

Urine on paths into your camp site often helps discourage game from entering. Don't sleep in a tree unless it is essential. This simply adds to your strain and nervous tension. If it is absolutely necessary to do so, pick a fork of the tree and tie yourself in with rope, belt, vine or green bark. But a platform built ten or fifteen feet up in a tree is a different matter, giving a restful sleep and a sense of security, and reducing mosquito attacks. The platform should be built of poles and covered with grass.

You can improvise shelter from aircraft parts, spare clothing or the surrounding vegetation. How elaborate it will be will de-

pend largely on the weather.

The simplest shelter from the sun, wind or rain is the lean-to, which can be constructed from available wood and vegetation. Try to find two trees approximately six feet apart in a line edgeon to the prevailing wind. Secure a cross-piece between them not less than four feet above the ground. To this tie back-pieces about two feet apart sloping to another cross-piece on the ground six to seven feet back from the trees and secured to them. For strength, other cross-pieces should be tied at twofoot intervals to the back-pieces, the whole being covered with whatever is available in the way of branches, grass or spare clothing. If necessary, the construction can be extended to a gabled and thatched roof. Start thatching at the lowest point



Lean-to Shelter

and overlap the succeeding upper layers to ensure that the rain will run off.

If you have or can find material you can make a shelter very quickly by draping groundsheet or parachute over cord, rope or an improvised one made of vine or bark, tied between two trees.

If there are no convenient trees against which to build the lean-to or if you would prefer a portable shelter which can be turned to avoid wind and rain, make a light framework shelter; construct a triangular frame for each end and tie a ridge pole to the apices; join the bottom corners of the triangular frames with poles; cover the shelter with groundsheet, grass or branches, as above.

Ropes for constructing shelters can be made from the bark of several trees, including the baobab (Adansonia digitata), the Prince of Wales feathers tree (Brachystegia boehmii) and muSasa (Brachystegia spiciformis), the sapling bark being easiest to work with. The two first-mentioned trees and the gingerbread or vegetable ivory palm (Hyphaene ventricosa), the young shoots of which can be used to provide a fibre for rope-making, are all fully described and illustrated at Appendix I. A very strong fibre which can be used for making excellent string can be obtained from the bowstring hemp, or mother-in-

law's tongue (sansevieria species), which is a very common plant in the Zambezi valley with stiff, upright, sword-shaped leaves, sometimes cylindrical, which may be overall dark green in colour or have irregular horizontal bands of dark green and grey-green.

Unless tactical considerations rule one out, you will almost certainly need a fire, no matter how short your stay in your present location is likely to be, partly to boost your morale, partly for cooking and, in the cold weather, to keep you warm. But remember—camp-fires, although they will keep most game away, may attract rampant rhino or hippo at night! There has also been at least one case of a hippo being attracted to and annoyed by a torch.

Always make your fire in a clearing, well away from any grass or bushes. Grass fires are easily started and often get out of control. Apart from other considerations, a grass fire ahead of or around you will denude the area of the plant, insect and animal food you may need for survival. One of the most effective cooking fires can be produced by putting two inches of sand into a metal container and adding petrol—from the crashed aircraft or unserviceable vehicle. To get the best out of a cooking fire, wall it in with stones which will both provide a resting place for any cooking utensils and concentrate the heat.

If you have to use natural fuel, you will need some form of kindling. Dry grass, fern or wood cut into long, very thin strips will serve. If you have petrol, use a very little but pour it on to the wood before you light it, never after. Dead, dry wood usually abounds in the bundu and even during the rainy season the inner parts of branches and trunks are dry. If dry wood is scarce, green wood can be used if cut very thin and supplemented with dry grass and dung. You will first have to find some form of tinder, such as threads from your own clothing, feathers, birds' nests, dry elephant or buffalo dung, or dry, finely powdered wood, provided by insects and found beneath the bark of dead trees.

To start the fire, arrange some kindling in a small pyramid

with an opening on the windward side for inserting a light. Make a spill from one or more thin strips, light it and apply to the kindling. Lay smaller, then larger, pieces of fuel on the kindling but don't make too big a fire. If for some reason you have neither matches nor a working lighter, starting a fire is going to take time and patience. Most people are familiar at long range with the principle of rubbing two sticks together to make a fire, but this takes practice and a good deal of trial and error.

It is much easier to use a convex glass to ignite the tinder; a magnifying glass or binocular lens are admirable, and a spectacle lens can also be used with a tinder of very dry elephant or buffalo dung. Alternatively, use a panga, knife or any other piece of steel to strike sparks from a piece of hard rock. The rock should be struck with a downward scraping movement so that sparks fall on the tinder. When the tinder smoulders, blow it into flame and add the kindling.

Build the smallest fire you can conveniently use and remember to put it out when you leave. Keep a sizable green branch handy just in case the fire gets out of hand. If you have had difficulty in lighting a fire and have to move, it is worth trying to carry a piece of smouldering elephant dung with you.

A human being feels naked and defenceless without a weapon of some sort. If you have a firearm, conserve your ammunition and make every shot count. Get as close as possible to your quarry, use a rest for rifle or pistol and fire only if you have a clear shot at a vital spot, the shoulder and chest being the best aiming spots for the larger game.

Keep your gun clean. Cover or wrap it in cloth when not in use and keep moving parts lightly oiled. Clean it at once if it gets dirty or if you fire it. Pull a cloth on a length of string through the barrel several times, then oil the cloth and pull it through again.

Never use a weapon as a hammer or lever.

The basic survival weapon is the knife; one with a blade about 12 inches long and the point of balance in the blade will

do very well and even a boy-scout knife will be most useful, as will an axe. But best of all is the panga, which can be used not only as a knife but as axe, weapon or digging tool. Any cutting edge needs to be kept sharp and, lacking file or whetstone, you can keep a keen edge by honing it on a log, piece of horn or hoof, using sand or ash as an abrasive.

If you have neither firearm nor knife, look about for a stout stick then, if you have time, try to find a cutting edge of some sort. You can make quite a useful knife by chipping an edge on

a flat and handily-shaped piece of stone.

Sleep with your weapon or stick close to hand.

#### CHAPTER V

## THE SEARCH FOR WATER

The greatest problem in the bundu is water. It is more important than either food or shelter. You can live a week or more without food, but only a short time without water.

In the hot Rhodesian climate a comfortable body temperature is maintained through evaporation of sweat from the skin which necessitates a constant replenishment of body water. Drinking water is thus essential for survival and even partial dehydration produces a tremendous falling-off in efficiency. So, if an unlimited supply is available in a nearby dam, river or vehicle, drink as much and as frequently as you want and certainly not less than four pints a day. Anything less will reduce your efficiency.

If, however, you are on patrol or a hunting trip far from home or, worse still, you are lost and uncertain when you will find water, conserve what you have and drink sparingly. You should aim to go without water for as long as you can, then drink as little as possible. If lost, avoid drinking during the first 24 hours, then drink all you can spare before moving off in the morning, gargle occasionally during the day and drink sparingly after sunset. Use heat exhaustion tablets if you have them; if not, add a little common salt to your drinking water.

To conserve your body water, move in the cool of the day. Rest in the shade between 11 a.m. and 3 p.m. Do not talk, keep the mouth closed and occasionally grind the teeth softly. You will nind that placing a small round stone under the tongue or chewing a piece of bark or mopane leaf will relieve your thirst.

If sufficient water is not readily available, clearly you must find it. The most obvious sources as well as the easiest to find are ponds, streams and rivers which may be located through studying the lie of the land, vegetation and soil and the direction of thickly marked converging game trails. Pans are usually situated on flat, poorly drained land between watersheds.

Animals drink mostly at sunrise and sunset, as do doves. sandgrouse, game birds and other birds, so if you see any large movement at these times it is certainly to and from water. However, ignore the giraffe, eland, duiker, steenbok, grysbok, squirrel and mongoose and the crested guineafowl, none of which are indicators of water. The Double-banded Sandgrouse is a widespread species of the bushveld and dry savannah. especially in Western Matabeleland, and is a most reliable indicator of water. About ten inches long, the male has black and buff bars on the forehead: neck, throat and upper chest are buff ending in a white band, then a black one; the overall impression of the rest of the body is of barred and spotted black and chestnut above, barred black and whitish beneath; the female lacks the buff chest and distinctive black and white bands. This species disperses widely to feed and, near dusk, makes a beeline to water, sometimes seven or eight miles away where, having drunk, the birds congregate in large flocks to chatter and sleep. They fly very fast but their flight to water is as straight as a compass bearing. Their voice in flight is a curious whistling call.

Follow the downward slope of the ground and keep your eyes open for tall reeds. Remember that game prefers waterholes with a high saline content and that water from some of the natural springs in the Western areas of Rhodesia may be so salty as to be undrinkable.

Do not be discouraged if you find only sandy river beds or dried-up pans. By digging, you may be able to reach water flowing beneath the surface of dry river beds, especially near big rocks, or lying beneath the sour-grass vleis of Mashonaland. Before digging, thrust a sharp stick deep into the sand; if it glistens, water is close. The lower levels of sandy river beds and confluences are likeliest places. Look for springs along the floors or sloping sides of dongas and up against the bottoms of escarpments.

If you have found water by digging in a "dry" river bed, you

can preserve the hole by lining it with bark and burying a grass bundle with two hollow reeds projecting. This will give you a small cistern, complete with drinking straws. Grass and reeds can also be used to get water from damp sand. Dig a foot or two into the river sand and bury a bundle of grass or plants and insert a hollow reed into it. Reeds are not hollow all the way through and the divisions must be perforated with a wire, thin reed or strong grass stem. By sucking hard you will be able to draw water out of the sand, the bundle acting as a sieve. If possible, do not swallow the water but spit it into a tin or other container. You can suck small quantities from river sand through a rag or handkerchief in extreme need.

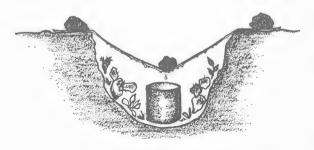
Collect dew or moisture from vegetation with a rag, which can be squeezed into a container. Use a poncho, groundsheet or piece of plastic sheeting to collect dew or rain from rock hollows. During the rainy season collect water by digging a hole

and lining it with groundsheet or poncho.

The tried and effective "still" illustrated will yield up to a pint of water in dry areas, but a large sheet of transparent

plastic is required for its construction.

To make the still, dig a hole approximately three feet in diameter and half as deep, preferably in a dry river bed or some similar place where the soil is damp. At the centre of the hole place a container and over the hole the plastic sheet, the edges of which should be weighted down with sand to seal the hole. The sheet should not be taut and should be depressed quite



steeply towards the container by a fist-sized stone placed in the centre of the sheet. Such moisture as is evaporated by the sun shining through the sheet will condense on the underside of the sheet, run to the weighted centre and drip into the container. This process can be accelerated by spreading crushed green vegetation on the bottom of the hole round the container. The still will work through the night and so should be left in continuous operation. The container also attracts insects which cannot get out of the hole and provide a food bonus. A large sheet of aluminium foil is one of the most useful items in any survival kit and a piece of it can be shaped into the water container. A piece cut off the plastic sheet will however serve as well.

If you are really thirsty, you will not be too finicky to take water from the stomach of fresh-killed game or to drink its milk or blood. Squeeze out the liquid from the finely chewed contents of the last stomach and strain through cloth into a container made from the animal's hide. To clarify the liquid, add small pieces of the liver. Do not take water from the stomach of a carnivore.

Look for large hollows which often form in the boles of trees, especially the baobab, and in which water collects. Never drink anything, however, from a tree, bush or climbing plant with white, milky sap. Cubes of baobab wood (not the bark) bitten and sucked provide a little moisture; each cube should be chewed and sucked once only, then discarded.

Climbing plants often have sap-conducting vessels under pressure in their stems; when cut, water may then run or be sucked out and can be drunk or run into a water bottle. However, as some climbers have poisonous saps, treat them with caution, unless they have really copious amounts of fluid, in which case the poison will be dilute. In any event, treat creeper saps with caution; suck a little and hold it in your mouth for a minute or two—if it has a bitter or disagreeable taste, spit it out; if it tastes bland or pleasant, swallow a little and if, after several hours, there are no ill effects, suck or drink more.

A certain amount of moisture is contained in some of the edible fruits but it is well to remember that no fruit will alleviate a serious thirst.

Practically all the streams, rivers and vleis of Rhodesia are infested with bilharzia, often indicated by snails under lily leaves. You can become infected either by drinking the water or by allowing it to come into contact with your skin. This won't matter to you if your life is at stake, and bilharzia can be cured. Nevertheless, its unpleasant effects are to be avoided if possible. Purify all water before drinking, except rain water and that collected from plants. The surest way is by boiling for at least one minute. Alternatively, the Army sterilising tablets or six drops of iodine to a quart of water can be used.

If you can't purify standing water in any other way, dig a hole three or four feet from the water's edge and wait for it to seep through. If you can't wait, place a handkerchief over the water and suck it through the cloth, or use strong, hollow reeds to penetrate the filthy top layer and draw up the cleaner water beneath. Water lily stems may be used similarly and also

make useful siphon tubes.

Do not bathe in cold water when exhausted or over-heated. Wipe your face after washing, because the drying effect of the

sun tightens the skin and accelerates sunburn.

Although seven-tenths of the Earth's surface is covered with water, the bundu is often dry. However, the importance of being able to swim cannot be over-emphasised. In the rainy season, especially, your chances of finding a swollen stream or river crossing your direction of travel are great.

Certainly every soldier and every Boy Scout should be able to swim. In the knowledge that there will always be some who for various reasons cannot do so, the construction of a few im-

provised aids for keeping affoat is now described.

Slow-moving water can be crossed by holding an empty box, jerrican or small oil or petrol drum to the chest and using breast stroke leg movements. Better still, join two empty boxes or tins together with a piece of rope or creeper to form a pair of water

wings, thus allowing the free use of both arms and legs. If you decide to make a raft, use light sound logs and check the floating quality of each before using it. If you can find nothing better to bind them together use bark string or braided grass.

Temporary buoys can be improvised from sacks, kit-bags or even a pair of service trousers. The last-named, thoroughly soaked, make an excellent buoy. Tie a knot at the end of each trouser leg and button the fly. If you are in the water, grasp one side of the waist band in each hand and throw the trousers over your head behind you; swing them forward and downward over your head, bringing the waist opening smartly down on the surface of the water, so trapping a pocket of air in each trouser leg. Then gather in the portion of the waist underwater and hold it tightly in one hand while swimming with the other.

If you have yet to enter the water, do so feet first, bringing the trousers forward over the head to trap the air as described above. When you rise to the surface, hold the waist band under water with both hands, then place the upper chest between the trouser legs and use breast stroke leg movements to propel yourself. Empty sacks or bags can be used in the same way.

In a party of two or more a swimmer may have to help a non-swimmer. The most effective method, but one requiring some confidence, is for the non-swimmer to lie on his back in the water, supporting himself by placing his hands on the swimmer's shoulders, arms outstretched.

The non-swimmer must keep his head well back, his arms straight and legs apart to avoid hampering the swimmer by bodily contact. The swimmer, using breast stroke, is then able to support and assist the non-swimmer over fair-sized rivers.

#### CHAPTER VI

## FOOD RESOURCES

A healthy man can last some time without food, but if you have a big appetite you will probably worry more about where your

next meal is coming from than anything else.

If you are lost or have force-landed and are not so seriously injured that you cannot aid the searchers, you are likely to be found within two or three days. So, if you have food, don't overdo the rationing; eat normally on the first day while you find water and set up camp. Even on limited rations try to have at least one meal a day, preferably two, and preferably hot. If natural foods are plentiful, keep as much of your rations in reserve as possible.

You can safely eat any African foods, should you be lucky enough to come across a kraal. Items which abound are sugar cane (Saccharum officinarum) imFi (N), iPxa (S), the African spinaches (Amaranthus species) Mohwa (S), Bwamanga (Ndau), Kaffir corn (Sorghum caffrorum) maBele (N), maPfunde (S) and bananas. Sugar cane grows as a cultivated plant and is often found near abandoned kraal sites, looks like maize stalks and may be more than eight feet high. A sweet juice can be chewed from the ripe cane after the outer layer of the stem has been peeled off. The African spinaches are widespread, especially on old kraal sites and along damp stream banks. They provide food for most of the year and are easily gathered. They are annual or perennial weeds with alternate, stalked, thin and transparent leaves; these are spearheadshaped and hairless; the spikes of very small, greenish flowers grow in clusters; one species has sharp spines growing where the leaves arise from the stems. The easily recognisable banana and plantain, which grow well as cultivated plants near kraals and in the rain forest areas, have great nutritional value.

The food resources of the bundu vary greatly, depending on

the area in which you find yourself and the season of the year. A sound knowledge of vegetation can be a great help in indicating by the species present whether you may find water or food and whether you should try game trapping. Vlei, kopje, mopane bush—each has a preponderance of certain species of flora and fauna. Where these types of country meet, an overlapping of species occurs, with a resultant increase in possible food sources.

Considerable quantities of food can be obtained from the Rhodesian vegetation, coming from the fruit, leaves, roots and gums of many shrubs, trees, grasses and creepers. (Recognition of these and where to look for them is best taught practically in the bundu. To describe and illustrate them fully is beyond the scope of this concise book). The few which are poisonous and to be avoided are pictured and described in detail at Appendices I-III, together with a small selection of edible plants, roots and fruits having a wide distribution.

Mushrooms and toadstools are pretty poor value as food, and although few are poisonous, the risks of making a mistake

are great.

There are no poisonous grasses and any you find may be eaten. Most of the world lives on grass seeds such as wheat, munga, rapoko and other cereals. True grasses are recognisable by their jointed stems. If you find grass with a growing head, jerk it off, which will leave a soft stem which may be eaten. Some grasses have small bulbs or swollen roots which are edible. The seeds are best gathered by beating the grain heads with a stick, over a cloth; then rub the grains to remove the husks. The grain can be boiled, or heated on the top of a shallow layer of sand in a container.

Many fruit-bearing bushes and trees are to be found near water-courses. The common water lily of the pans has an edible bulb. This is at its best about May or June and can be collected in shallow water or when the pan has dried up. It can be eaten raw or cooked like the potato.

You can eat anything the monkeys and baboons eat-but

remember to remove the bulbous tip of the tail of a scorpion! Birds, too, are a fairly safe guide, though not an infallible one, as some of the berries they eat are poisonous to humans.

If you are not sure of a plant, test it as you have tested water; take a mouthful, chew and hold it in your mouth for a few minutes. If it is bitter or disagreeable in any way, spit it out. If it tastes good, eat a little and, if there are no ill effects, eat a larger quantity next day. Ripe fruits are usually safer to eat than partially ripe fruits, some of which when green are actually poisonous.

Turn from the plants to the insects. Weight for weight, animal food will give you more value than anything vegetable. Everything that creeps, crawls, walks, swims or flies is a possible meal—and this includes insects, which are rich in fat.

If the idea of eating insects does not appeal, console yourself with the thought that you have certainly eaten many in bread, fruit and vegetables without realising it, particularly at boarding school.

You may find scorpions in the sandveld in holes with openings about one to one and a half inches by three eighths to three quarters of an inch. Test for scorpions by poking a length of grass down the hole.

Grasshoppers and locusts taste quite good when smoked, after the head and the innards have been removed. Flying ants may be eaten raw, or scorched and kept for eating later. Most dragonflies, caught on birdlime and then roasted, and many hairless caterpillars, sundried, smoked or boiled, are edible. The grubs found under dead tree bark are also palatable after grilling.

Through countless centuries honey has improved man's health. It could sustain you in the bundu.

You may be lucky enough for one of the honey-guide birds to persuade you to follow it to a wild beehive, which you can raid with smoke. Do this either by holding a handful of burning sticks at the entrance of the hive and blowing the smoke into it or by lighting a fire at the foot of the tree, feeding it with green leaves and directing the smoke to the hive entrance. Do this for at least ten minutes before opening the hive. The most vicious bees to deal with seem to be those whose hives are in rock crevices.

Only the two larger species of honey-guides will actually guide humans (or honey badgers) to bees' nests. These are the Greater or Black-throated and the Scaly-throated Honey-Guides. Both are about seven and a half inches long, and of nondescript colouring. The former is a sooty grey above, with black throat and dirty white chest and belly. To attract attention, it makes a chattering noise somewhat resembling a half-empty matchbox rattled lengthwise. The Scaly-throated variety is olive-green above, head streaked with pale yellow, underparts yellowish-white, with the throat and chest spotted with black. It chatters too, but also has an ascending, trilling churr.

Eat honey sparingly, especially if water is short. You can always carry some away in bark—but remember to leave a generous portion for the bird. (Bee grubs, too, are well worth

eating).

Besides the ordinary wild bees, the stingless or mopane bees also make honey, which can be obtained without resorting to smoke. The nests of one species known as Ngogomtshane (N) and Wodza or Munungira (S), in hollow tree-trunks or holes in walls, are recognisable by the horn-like spouts leading from them, made of resins and gums. Another species of the mopane bee, known as Botshi or Mbongolwane (N) and Monga (S), makes a similar nest in the ground.

Within the nest is a brood section and a food storage section. The former section consists of irregular masses of spherical cells or layers of hexagonal cells. Honey and pollen are, however, stored separately in the food section in round or elliptical wax pots. This honey, too, should be eaten most sparingly unless you have ample water. However, there is seldom more than a mouthful in a hive.

Almost all reptiles make good eating. A snake is best caught

by pinning it to the ground by the neck with a long, forked stick. Alternatively, use a stick to break its back by hitting it sideways. Don't try to kill it by hitting it on the head. The python is easily killed and will make a good meal for several people. It is however protected by law.

If you are going to eat the snake, remove head and poison sacs by cutting two or three inches back from the head. Coil

and grill it, then scale and gut it before eating.

Tortoises and turtles should be removed from the shell and gutted, then grilled or smoked in the shell. If possible, turtles should first be boiled to remove the smell. Lizards and leguaans taste good grilled, as does much of the meat of the crocodile which is, however, also on the protected list.

Lizards move sluggishly in the early morning, when they are most easily stalked and caught or hit. However, they will lie unmoving in the sun for long periods and, if you are practised, can be picked off with a slingshot or a rubber band cut from an inner tube.

Never eat a toad, because of the poisonous glands in the skin. Frogs, however, are good eating, especially the hind legs. They should be skinned and the head removed entirely immediately after killing. Use both hands to catch a frog, attracting its attention with one and grabbing it from behind with the other.

Fish is one of the most reliable sources of food. Practically all are edible but skin the vundu or any muddy fish before cooking.

Fish may be caught by line, speared, netted, trapped or poisoned. With a little knowledge and improvisation, all these methods will be available to you. A line can be improvised from clothing and threads or plant fibres, hooks from wire or pins. Use worms, insects and scraps of food as bait.

Fish poisons can be made from the fruits, bark or latex of certain trees, some of which are described here in detail.

They are:

Croton megalobotrys-umTua (N), Gubouga (Ndau), mToowa

(Tonga).

A medium-sized to large tree with pale yellowish-grey bark, found in the riverine fringes of lowveld rivers. The alternate leaves are elliptic to diamond-shaped, tapering to a sharp point and are carried on long stalks with two small glands on either side at the leaf base; green and hairless above, leaves are densely woolly beneath, with three veins rising from the leaf base. The fruits, pale brown and the size of a walnut, are hard, woody and rounded; inside are three large seeds which, if eaten, have a strong purgative action. The bark is used by several tribes as a fish poison.

Strychnos stuhlmannii—Kyapeni (N).

A small to medium-sized tree also found in riverine fringes in the lowveld. The thin, opposite leaves are rounded at the apex and narrowed gradually to the base, up to eight inches long and three inches wide, short-stalked, with three veins rising from the base and two some distance from it. The clusters of small, greenish flowers bloom in the leaf axils. The fruit is small, not more than three-quarters of an inch in diameter, with a thin skin, blackish-purple when ripe and containing a single seed. The fruit is poisonous to man and the crushed seed makes an effective fish poison.

Swartzia madagascariensis-Snake bean, umShonkwe (N),

muTserekese (S).

This is a common small tree with a rough brown bark, wide-spread in Rhodesia. The leaves are alternate and divided into between two and four pairs of alternate, stalked leaflets, oblong-elliptic, rounded at both ends, sometimes with a small notch at the end, and hairy. White-petalled flowers may bloom singly or in small irregular clusters in the axils. The hard, shiny, dark brown pods may be up to six inches long and half an inch in diameter; crushed, they make a fish poison.

Euphorbia ingens-Candelabra tree, umHlonhlo (N),

muHonde (M).

A well-known tree with a smooth, brown bark, up to 30 feet tall, found on granite kopjes or antheaps in the highveld but more widely distributed in the lowveld. The succulent, leafless but spiny branches curve upwards, becoming vertical and divided into oblong segments. It has a copious, milky latex which can be used as a fish poison.

Tephrosia species

The pods of both species are used as fish poisons and one, *Tephrosia vogelii*—Fish bean—is often cultivated by the African for this purpose. This grows as a shrub, about eight feet high. Its alternate leaves are divided into 8-10 pairs of opposite, spearhead-shaped, grey, silky-hairy leaflets. The white to pale purple, pea-like flowers grow in dense clusters. The pods are flattened and velvety brown or grey.

The other species, *Tephrosia dasyphylla*—Nyakanyimo (M)—is a smaller, erect shrub of about two feet, with a wide distribution. It has alternate, stalked leaves, divided into blunt, spearhead-shaped, pale green leaflets, hairless above, grey, velvety-hairy beneath. Its clusters of perilike flowers are pale blue or mauve. The woody pod is flattened and grey or velvety

brown.

It is not possible to indicate quantities of the various poisons in relation to volume of water. Use all you can find.

Poisoned fish should be boiled before eating.

In shallow water, fish can be killed with the back of a panga or speared with a sharpened stick. It is worth trying to attract them at night with a torch over the water, when you may try

your sharpened stick.

Generally, the deeper the water, the more the fish. In shallow streams the best spots to fish are where the food would normally drift, and at the foot of falls and rapids. Fishing is best along the banks at feeding times—early morning and in the evening. (Open the stomachs of freshly-caught fish and see what they

are feeding on, then try to obtain similar bait in the pools).

If you have the time and the patience, make a fish trap to be assured of regular meals. In its simplest form this consists of two walls of closely-spaced sticks shaped like a wide-mouthed funnel leading into a pen. In small, shallow streams, build the trap so that the stream is blocked except for the mouth of the funnel.

Nets are quicker and more efficient than hook and line or trap. A mosquito net or an Army camouflaged face veil can be used for netting fish. Remember to disturb as much mud as you can, as this blinds the fish, which will blunder into the net. In shallow pools, the mud on their gills forces them to the surface when, if approached cautiously, they may be scooped on to the bank with your cupped hands. If the stream is narrow and full of sticks or sharp stones, use the net as a trap and drive the fish into it.

Fish may be cooked in several ways—smoked, boiled, grilled, sun-dried or baked in clay—skin and scales will come off when the baked clay is removed. Don't overlook crabs, prawns and freshwater mussels, which may be boiled and the flesh winkled out of the shells with a pin. Land and water snails are also a source of both food and water and are not unappetising.

Birds may feed even a man without weapons. Nests take some finding but all their eggs are edible when fresh, even if they contain embryos. Practically all the Rhodesian birds are edible but avoid eating the kingfishers, the carrion eaters—especially the crows—and the honey-guides and their eggs.

Birds may be caught on birdlime, which can be made from the boiled latex of several trees, including the euphorbia, and from the chewed fruit of a number of the *Loranthus* species—Matches, iNofi (N), Gomarangwa (S)—which are mistletoe-like parasites with red, matchlike flowers. The birdlime should be twisted on grass near water or nests. Be sure to bury it when you have no further need to catch birds.

Lacking both botanical knowledge and firearm, you must resort to "still" hunting or trapping. To "still" hunt, watch where birds gather or pass, such as water, feeding place or nesting area. Hide downwind nearby, remain absolutely still and wait for one to come within range, then kill it as best you can.

Birds can be baked in clay, with the entrails removed but not the feathers. Place the clay-covered bird on or under the coals. When the clay cracks the bird is done and you will find that as you remove the clay the feathers come away with it.

Practically all freshly killed animals may be eaten. How you hunt them will depend on your experience and your equipment. The descent of a fair number of vultures is a good indication of

a kill from which you may profit.

The skilled hunter with the right weapon may kill his animal with a single shot but the average man or one without a weapon has to depend on patience, staying power and luck. It must be remembered that a licence or permit is necessary for shooting any game, including game birds, and that the penalties for poaching are severe. However, the majority of small birds, reptiles and rodents are not protected. In any case, hunting for food is a serious matter and, if your survival is at stake, you will certainly take a chance on legal retribution. The best time for hunting is early morning or just after sunset. Game is most plentiful and easily found near water and in clearings in the bush or in patches of bush in open land. Traps and snares can provide your food supply even if you have no firearm.

Many small animals live in holes in the ground or hollow trees. Poke a flexible stick into the hole to find out if it is occupied. If it is, close all but the one hole and prod the animal into coming out. You may be able to pull it out by tangling the end of a forked or barbed stick in the fur or skin. It is also possible to drive small animals and bird from their holes by

smoke.

It is advisable to skin any animal as soon as possible after killing it. The animal can be hung by either the hind legs or horns or, if too long or heavy for lifting, it can be skinned on the ground.

Assuming the beast to be too large for lifting, roll it on its

back and, with a pointed knife, slit the skin along an imaginary line between the point of the chin and the anus. Start on the breast and work both ways, being careful not to cut through the abdominal wall at this stage. Then slit the skin on all four legs along the inner side of the limb from hoof to centre-line and ring each leg above the hoof. If the head is not wanted, cut it off or ring the neck behind the ears. If it is to be used, cut carefully around the lips. Remove the skin by kneading it off with the fists. When it is detached, leave the carcass lying on it for the sake of cleanliness. Now carefully slit the abdominal wall from the breastbone to the junction of the thighs, so that the intestines are not puntured or cut. Open the abdomen and remove the entrails, cutting out windpipe and rectum.

The carcass is now ready for butchering, which is best done by first cutting off haunches, shoulders and neck, removing the fillets which lie along the backbone, splitting the ribcage and finally cutting off the brisket, which is the flesh along the under-

side of the breast.

To get the best out of the meat, make biltong from the haunches and shoulders and cook the rest as follows:

Grill the fillets.

Salt and wind-dry the ribcage, which is then also grilled.

Fry or grill the liver and kidneys.

Stew the neck and any of the offal you need.

Roll and secure the brisket with a wooden peg; it is excellent

boiled or pot-roasted.

Both birds and game are subject to parasitic infestations of worms, not only in the intestines but also embedded in the flesh. So cook all meat well.

A shoulder or haunch not cut into can be preserved for several days simply by hanging up, when the tissues surrounding the meat dry to form an airtight covering. Cooked meat also lasts for some time. Any surplus meat may therefore be fried or grilled, then covered with melted fat and stored.

To make biltong, cut the meat along the tissues joining the muscles so that they are left whole. Cut off the sinewy ends of

the muscles and slice lengthwise with a sharp knife to ensure a smooth cut, as jagged ends attract blowfly. The thickness will depend on the time of year and how quickly the biltong is wanted; if quickly, or in damp weather, cut into thin strips. Salt and pack overnight in a container to absorb brine (the hide makes a suitable container). Moisture ruins biltong so, in damp weather, lay the biltong out in the direct sunlight for quick curing, preferably over wire or the branches of a dead tree, turning the meat frequently at first so that every part has some contact with fresh air.

Thin strips may be eaten after three days of curing; thicker

pieces take longer.

The dry months are the best time for making biltong. In the wet season, maggots and mildew are hazards and, at the height of the rains, curing is practically impossible. Don't overdo the salt because, as the biltong dries and shrinks, the salt becomes concentrated. Pepper added before hanging improves the

flavour and helps keep the flies away.

Either meat or fish may be preserved by smoking, but the African method of smoking over open fires for a few days is unsatisfactory as maggot flies infest it. Smoking is best done in a closed container, a clean metal drum with a lid being suitable. The meat is laid on sticks wedged across the top of the drum and smoke is provided from wood shavings smouldering in the bottom of the drum and prevented from escaping by a tight lid. Choice of wood is important, as the smoke imparts a flavour to the food. Acacia or thorn bush wood are suggested; maize cobs are excellent.

The large sheet of heavy aluminium foil in your survival kit may be used for wrapping roots, fish, birds or meat, which can then be put directly into the fire for cooking. The foil may also be shaped into a pot or pan for normal cooking over the fire or used to line a hole in the ground to serve as a pot for stone boiling. Here stones are heated in a fire, then put into the pot of water or food to provide the heat for boiling the water or warming the food.

# DANGEROUS ANIMALS, REPTILES AND INSECTS

All animals and reptiles fear and tend to shun humans. If animals are treated with respect there is little to fear from them. Bravado with wild animals is stupid—and caution is not cowardice. To skirt even a very large herd of animals takes little time and is unlikely to affect the outcome of a patrol or pursuit.

Animals like to lie up in thick, shady patches of bush during the day and may demonstrate if disturbed. If you do disturb and irritate a sleeping animal, remember that to run away is the worst thing you can do. Most animals are capable of surprising speed, and the clumsy-looking elephant can run at twice the speed of a man. The cardinal rule, if a dangerous animal is encountered, is to stop, withdraw softly and move away downwind carefully.

While it is easy to categorise animals broadly into dangerous and useful groups, it is impossible to generalise and there are

many popular misconceptions about them.

Among the animals generally accepted as dangerous are elephant, lion, leopard, buffalo and rhinoceros. In addition, the hippopotamus, hyena, wild dog, cheetah and baboon can be hazards in certain circumstances.

The Elephant—is generally good-tempered and intelligent, living in various-sized herds in thickly wooded country, straying across open country to find other feeding grounds but rarely wandering far from water. They will disperse during the rainy weather when water is plentiful but congregate in valleys and near river systems in the dry season. They will drink at any time but when water is scarce often restrict their drinking to the night. After drinking, they normally disperse to feed. They may feed continuously, but mainly during the cool hours, on grass and on the bark, fruits, roots and foliage of trees. In order to

reach the higher branches, where more succulent morsels are beyond reach of their trunks, they often uproot the tree by pushing or pulling it down, so that in addition to their tracks and heaps of dung, uprooted trees and broken branches often mark their presence or passage. Elephant dung seems unchanged by the digestive processes and is frequently full of beetles and insects feeding upon the undigested seeds, being eaten in turn by mice, shrews and birds.

Requiring enormous quantities of food, elephant are capable of travelling long distances in search of food and water. They usually move quietly on paths following the easiest routes to water. They have keen hearing and a highly-developed sense of smell. Although their eyesight is poor, they see almost as well at night as by day, instantly detect movement, and would seem to recognise humans at considerable distances. They fear humans; once they catch sight, smell or sound of them, they usually move away. This applies mainly to lone bulls and small bull herds. Cow herds can be extremely dangerous when aggravated. If shot at, they have been known to seek out and kill the hunter. Tuskless cows in particular are least kindly disposed towards humans.

Because they are among the most commonly encountered game, you would be well-advised to avoid disturbing elephant. If you see any, evasive action should be your first thought. If pestered, an elephant may demonstrate with either a silent or a noisy rush. It is not easy to distinguish between a demonstration and a pending charge but, if the beast tucks its trunk away and flattens its ears, you may be sure it means business.

If an elephant demonstrates, stand still until it stops, then move off slowly down-wind, preferably without showing yourself. If you are mounted in a vehicle, a counter-demonstration sometimes works. This should be no more than a very slow approach with the engine revving. Don't make the mistake of shooting at the elephant, especially with a service rifle, the calibre of which is too small to stop a charge. Furthermore, a wounded beast is a hazard to yourself and to others in the area

-and is likely to make you most unpopular with the Game

Department, which has to seek out and kill it.

The Lion—enjoys a fearsome reputation. While the small lions of Matabeleland have a reputation for attacking man, usually the lion only attacks under provocation and avoids humans in normal circumstances. Lions may therefore be regarded as a lesser hazard, unless a lioness with cubs is encountered, when a hair-raising demonstration may be expected. A cubless female "baby-sitter" is even more dangerous than the mother. Your reaction to an encounter with a lion should be a very rapid and unobtrusive disappearance from the scene.

Lions use a number of sounds for communication, including coughs, low moans, a deep-throated rumble and a full-bodied roar. The moan is frequently used by the mother to control the cubs. Lions do not make a noise when hunting, so their roaring at night is no cause for alarm. Like all cats and most other animals, the lion needs movement to attract its attention, and, if this is absent, it soon loses interest in whatever attracted its attention in the first place. It is possible to get quite close to an animal by moving only when it is looking the other way and freezing instantly when it moves its head. Observed movement—and especially running away—is on the other hand an invitation for the carnivore to become aggressive.

When the lion decides to charge he drops his head, twitches his tail, then erects it, and utters a series of grumbling growls, moving forward at increasing speed. Lions are not wanton killers and normally kill only to survive. Having eaten, they wander off to the nearest water and it is then that they roar loudly, usually three or four times, following this with a series of grunts or coughs. Lions are attracted to camps by the pre-

sence of meat or drying fish.

A master of camouflage, the lion takes advantage of the smallest cover, flattening itself so closely to the ground as to seem part of it.

The Leopard—has many of the characteristics of the lion. It is a rather short-legged but strongly built and formidable

carnivorous animal. Larger than the cheetah, it is considerably smaller than the lion but this is more than offset by its ferocity, tenacity and agility when preying on, among other things, domestic stock, dassies and sleeping baboons. It may attack from the ground but often waylays its prey by lying flat along the branch of a large tree from which it drops upon its victim. It is a dangerous animal to meet at any time, especially when cornered or wounded. The leopard is more common in Rhodesia than is generally known, even in inhabited areas but, due to its stealthy habits, it is seldom seen. Leopards live mainly in the mountains but are not uncommon in the bush.

The Buffalo—resembles and even smells like domestic cattle but is immediately identifiable by its size and heavy horns. Usually found in large herds, like wild cattle, they are inquisitive and suspicious animals and the city dweller may understandably be unnerved by a herd of buffalo trotting towards him, a few yards at a time. Nevertheless, any confident movement on his part would send them galloping off into the bush. A wounded and isolated buffalo, however, is a very different proposition, for it may double back and lie in wait for the unwary pursuer. Do not disturb even an unwounded one more than twice if, each time, it moves off in the direction in which you are travelling.

you are travelling.

Water is essential to buffalo and they are seldom found far from it. However, they occasionally go a few days without it and may then be found over twelve miles from it. They mainly graze but also browse on the leaves of bushes, usually resting in some shady place in the heat of the day. Your main danger is that of stumbling across and startling a buffalo resting in a thick patch of bush, when its reaction is unpredictable. Your best course then is to clap your hands loudly and shout at it. In general, avoid such places, as the rhinoceros also likes them.

The Rhinoceros—varies considerably in temperament, some being quite good-tempered, others rather irritable. Inquisitive of suspicious-looking objects, they are attracted by noise, by camp-fires. Although short-sighted, they have excellent hear-

ing. They sometimes charge without provocation on getting the "wind" of humans but may just as readily gallop off in the opposite direction and complete a large circuit to return for a second look. While charges may only be intended as threatening demonstrations, they should be taken seriously. As with the other big animals described above, the best course of action should you disturb a rhino is to stop, withdraw softly and move down-wind quietly and carefully. If one charges you, try to climb at least eight feet up the nearest tree; if the rhino is too quick to permit of this, get behind the tree and freeze!

Only the black rhinoceros is now found outside reserves in Rhodesia. It browses on low vegetation and is partial to acacia

thorn country.

The Hippopotamus-is a sociable animal, usually found in small parties in deep water. During daylight it floats at a safe distance from shore, with a wary eye on possible danger from man. It dislikes and will attack and smash canoes and small boats with its jaws. It leaves the water at night to feed on grasses and other vegetation on the land, and is attracted and often angered by camp-fires. When disturbed ashore, the hippo rushes blindly along its well-worn paths and will trample anything in

the way.

The Spotted Hyena-is of an overall dull, tawny colour above, mottled with light to dark brown marks, the hair quite short but with a short mane of longer hair from the base of the head to the shoulders. Its call is a rising "whoo-oop" and is a fairly common sound in the bundu night. A wanderer and scavenger, the hyena will often enter camp sites to steal food and even boots, for their leather. Like lion they are attracted by meat or fish in a camp. Although cowardly in the face of danger, hyenas will carry off helpless and undefended young animals and even attack large domestic stock. Although they will seldom attack a camp if there are several people in it, they have been known to attack defenceless or sleeping humans, and Africans sleeping outside their huts have sometimes had parts of their faces torn away.

The Wild Dog—is a small animal whose overall length of head and body seldom exceeds three feet. It has long, slender legs and long, rounded ears. The colour varies considerably in individuals. Usually the muzzle is dark brown and the brush white, but the rest may be mottled dark brown, black and yellow or even whitish, with dark brown or black, unevenly distributed marks. The dogs hunt in packs, usually of from one to three dozen in number, running down their antelope prey and even domestic stock, which they tear to pieces. If game is short, they sometimes hunt cane rats in the same way as do domestic dogs. They shun man and, though a pack may face up to a hunter in aggressive manner, they are most unlikely to attack. If encountered on a kill, they can be easily driven off it.

The Cheetah—is a member of the cat family, although it has some distinctive features. While at a quick glance you might see some resemblance to a leopard, the obvious differences in the cheetah are the long legs and the spots which are solid black marks, not the rosettes found on the leopard. A magnificent hunter and the fastest animal in the world, the cheetah is in the habit of running down its prey, usually the smaller antelopes. It is not a ferocious animal and has only been known to attack man in defence of its young. It is easily driven off a

kill.

The Baboon—tends to occur in fairly large troops, foraging by day and sleeping by night in the shelter of caves and rocks in the mountains or in the branches of large trees. They are a pest to farmers and, in areas where they become accustomed to humans, can be aggressive. Troops are usually led by old males, which defend the females and the young ones in the event of attack. Young males will often adopt a threatening attitude towards humans for little reason. A baboon will eat almost anything—fruit and grain, roots, the shoots of young leaves, insects and even young animals. It is fond of scorpions, removing the sting and nippers before eating the rest. It is afraid of and constantly alert for snakes but its greatest natural enemy is the leopard, which having found the sleeping place of a troop

from the noise the old males make, waits until they are all asleep, then dashes in and seizes a youngster before the old males can defend them. Baboons, it is worth noting, are instantly alarmed by and will run away at the sight of an armed man.

Snakes—produce in most people an understandable though unreasoning fear; the normal reaction is that the only good snake is a dead one. However, snakes play an important part in maintaining the balance of nature and, of the 60-odd different snakes in Rhodesia, most are harmless. Identification is therefore important, not only to ensure that the correct treatment is given if you are bitten, but to prevent the unnecessary

killing of a harmless and inoffensive snake.

Snakes blend well with their surroundings, due to their protective colours in various patterns and shapes. The same species may be dark on dark soil and light when the background is mainly light. Snakes are a minor hazard but a real one. Although a mamba may attack you if you get between it and its hole, you may take it in general that a snake will only attack if surprised or trodden on. Keep as far as possible to paths, avoiding kopjes, tall grass and riverine bush. Wear boots and step on to, rather than over, logs and rocks. Look well ahead as you walk. If you come across a snake basking in the sun, try not to alarm it but make a small detour around it.

The most poisonous snakes in Rhodesia are the two species of mamba, four species of cobra, the twig snake and boomslang, the puff-adder, berg adder, horned adder, night adders and gaboon viper. (These are described in detail and illustrated at Appendix IV). All are capable of inflicting bites which are fatal if not treated. There is no sure cure for a bite from a venomous snake unless the proper anti-venene is administered immediately after the bite. However, not all bites by poisonous snakes are fatal, even if left untreated, because the snake does not always inject a lethal dose of venom. For this reason, any treatment may sometimes appear to have beneficial results. Because there is sometimes severe reaction to anti-venene, do

not inject it if you are sure the casualty was bitten by a non-venomous snake.

A bite from a snake other than a venomous one can be quite painful but severe pain, swelling and discoloration are the first symptoms of an adder bite, while a burning sensation in the vicinity of the bite, drowsiness and disturbed vision are the usual first symptoms of a bite by a mamba or cobra. It is important to note that although discoloration and slight swelling may follow the bite of a boomslang or twig snake, there is little, if any, pain. Nevertheless, these are two of the most potent venoms.

Snakebite outfits contain a polyvalent anti-venene. Identification of the snake, or a useful description of it, is however vital to the selection of the correct anti-venene and administration of the right amount in the medical treatment which should follow as soon as possible after the first aid.

If you have no snakebite outfit, you may use a ligature for all but adder bites, applying it as described in the chapter on first aid. Incisions to allow the wound to bleed or the use of potassium permanganate are not recommended. The best way to delay the effects of snakebite is to keep calm and, if possible, to lie down and keep still. If a ligature is used, ensure that a pulse is still discernible in the affected limb, below the ligature, after application; remember to release the ligature for half a minute every 20 minutes. If breathing stops, apply artificial respiration.

Watch where you step, where you reach and—most important—where you sit, as it will be apparent from the foregoing that bites on the trunk cannot be dealt with successfully!

The black-necked cobra and ringhals are the only known spitters and should you get the spit of either in the eye, use milk or water to dilute or neutralise it—even urine will do. Remember that it is the snake you don't see that will bite you.

Crocodiles—need no identification; if anything they are so well known that they are too often treated with contempt. In their turn, being protected by law, they have tended to lose

their fear of humans and to become aggressive. Always treat them with respect and any stream or river with the caution that the possible presence of crocodiles warrants. If possible, cross water by trees, rocks or raft. If you have to swim, splash and make as much noise as possible.

Turn from the big and the bulky to the other end of the scale, to the insects and the spiders. Two tiny insects—the mosquito and the tsetse fly-are health hazards and, with the mopane

bee, can be most irritating.

Mosquitoes are a pest for much of the year but only some of the genus Anopheles are malaria carriers. These settle with proboscis and body in one straight line at an angle of 45° to the chosen site on the victim and unlike the non-malarial mosquitoes, do not give warning of their presence by the familiar whining buzz. Every Rhodesian regular soldier takes a weekly anti-malaria prophylactic and this is recommended not only for all who work in the bundu but for those contemplating hunting, fishing or camping trips.

Insect repellants help but have only a short-term effect on a perspiring man. A small veil of white mosquito net helps keep the mopane bee out of the eyes and repels the tsetse fly. The fly may be as small as a house fly or up to half an inch in length. It is recognisable by its brown colour, by its strong proboscis and by the fact that at rest its wings are folded like the blades of a pair of scissors. If within a fortnight of being in a tsetse fly area you feel indisposed, see a doctor at the earliest op-

portunity.

The mopane bees swarm out of their nests if disturbed and buzz about in front of one's face, settling on the head and forehead and crawling into one's eyes, mouth and nose. Although stingless, the bees can and do bite freely on occasion.

If you have been walking through long grass, examine your body and limbs at night for ticks. Don't pull these off but burn them and leeches—with the glowing end of a cigarette.

Hairy caterpillars and centipedes should be flicked off with a stick, the latter from the back forward—it is armed with a pair of poison claws just behind the head and a pair of sharply

clawed legs at the hind end of the body.

The dreaded button spider is said to be rare in Rhodesia but it has been seen in the entrance to a well-known city club by a sober scientist! Serious illness results from its bite, ending fatally in about three per cent of the cases. The poison is extremely virulent but a serum has been developed that makes its bite practically harmless. The male is very rarely seen due to his retiring habits—and the propensity of the female for eating him!

The female is black, with indistinct white markings on the back, and occasionally may have a dark red spot at the tip of the tail. Its name is probably derived from its rounded shoe button-like abdomen, which is about half an inch in diameter. The head and thorax are small and narrow, the legs long,

slender and black.

The female makes an irregular nest of strong silken threads near the ground, usually in the shelter of a stone or bush, with a cylindrical retreat for herself where she waits for her victims, which are usually ground-beetles. As in the case of snakes, identification of the culprit is important, and a bite by a button spider should be treated like snakebite, pending availability of the serum. This is the only really dangerous spider. While some spider bites may have unpleasant effects, even that of the large brown "tarantula" is no worse than a bee-sting.

### CHAPTER VIII

## TRAPS AND SNARES

Traps and snares are generally easy to construct and may be very useful for survival, by extending your limited rations, as well as for such military purposes as setting camp alarms and

explosive ambushes.

In its simplest form the snare is a wire or cord loop placed on a game path in such a way that the animal puts its head into it and is strangled. It is easy to make and set and is very efficient. It is very frequently used by Africans for killing animals and birds.

Any type of cord or wire may be used for snares; a nylon line of 100-lb. breaking strain will hold a small buck and a 20-lb. line a guinea fowl. Several trees have bark suitable for making string. To find a good bark, break a branch and strip the bark. If it comes off in long fibres, it is usually suitable. Use only the inner, fibrous part of the bark, removing the outer bark by bending sharply at one end, then running the doubled strip through the fingers. Take a strip about a quarter of an inch wide and split it into two. Keep it moist by chewing, and spin the string by twisting the bark between the palm of the hand and the bare thigh.

Some snares need an eye-splice. To make one of bark, place two strips of bark together and, four inches from one end, twist a length equal to the circumference of the eye you want, doubling the twisted section over to form the eye. Then, holding the loop, twist the four strands together to continue making

the string.

The placing of traps and snares is very important. You should look for obvious feeding and watering places, nests or holes, game paths or gaps in fences, frequent use of which is indicated by fresh trails or droppings.

The snare should be placed, as far as possible, in some place

where the game is forced to pass. If necessary, create such a situation by arranging bush or stones in such a way as to ensure that the victim's head must enter the loop. The size of the loop must be such that the animal's head but not its body will pass through easily. Set as many snares as you can. As bait, use fruits or meat, including entrails from any animal or bird you may have been able to kill.

Six of the basic and most useful knots for use with traps and snares and for other purposes are (i) the reef knot, (ii) the sheet bend, (iii) the round turn and two half hitches, (iv) the bowline, (v) the clove hitch and (vi) the timber hitch. (See illustrations on page 66).

1. The Reef Knot—is best for tying two ropes or cords together under strain. It is one of the simplest knots, easy to tie

and yet will not slip.

2. The Sheet Bend-is used for joining together ropes of equal or unequal thickness. Make a loop with one rope, pass one end of the other through and round the whole loop, then bend under its own standing part.

3. The Round Turn and Two Half Hitches-may be used for tying a rope to a pole or length of wood. Pass the end of the rope round the standing part and behind itself; turn the free

end back to form two successive loops.

4. The Bowline—is a loop which will not slip. Form a loop then a second and smaller loop in the standing part; pass the end of the large loop through this, then behind the standing part and down through the small loop.

5. The Clove Hitch—is used for fastening a rope to a pole or length of wood. Either end will stand a strain without slipping

lengthways or sideways.

6. The Timber Hitch—is used for securing the end of a rope

to a pole.

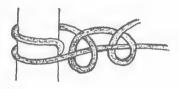
Several types of snares and traps and details of their construction are illustrated. All are simple to make from materials at hand in the bundu but the adjustment of the trigger takes time and can be a most exasperating business.



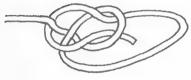
The Reef Knot



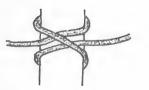
The Sheet Bend



The Round Turn and Two Half Hitches



The Bowline



The Clove Hitch



The Timber Hitch

Three variants of the notched-peg snare are illustrated at Figures 1, 2 and 3. An animal running into the noose of the former disengages the notched sticks: for maximum effectiveness both notches should be well-shaped V's so that the point of one V will rest within the other; the noose should be tied to the top of the movable peg while the cord to the sapling is secured to the bottom of the peg to provide maximum leverage. Figures 2 and 3 show modifications to catch an animal by leg or leg and head.

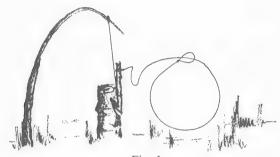


Fig. 1

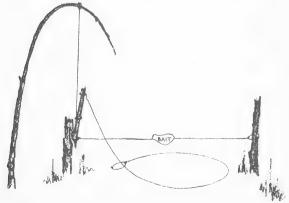


Fig. 2

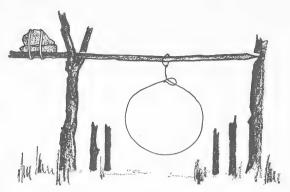


Fig. 3

For the two-peg snare at Figure 4, the notches in the uprights should be notched to V-points and the ends of the horizontal pointed. Best leverage is obtained by tying the sapling cord at one end of the horizontal and the noose at the other.

The slip-knot snare is simple, easy to set and sensitive. It is

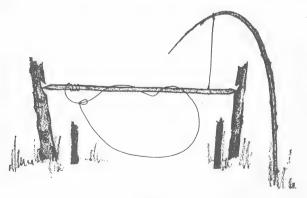


Fig. 4



Fig. 5

shown at Figure 5. Simply make a slip-knot in the line and place the overhand twist of the loose knot (not the end loop) over the stake and tighten.

The treadle snare at Figure 6 is suitable for the larger animal which, stepping on the treadle of twigs, covered with dead leaves, pushes down the cross-stick, releasing the sapling.

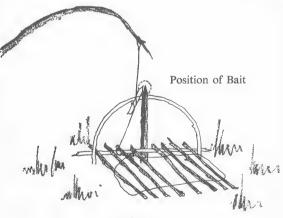


Fig. 6

The deadfall is preferable to the snare for larger game but takes time, effort and patience to make and is only recommended where there is an abundance of animal life.

An old, reliable way is the figure-4 trigger, which may be improved as at Figure 7 making the junction of diagonal and

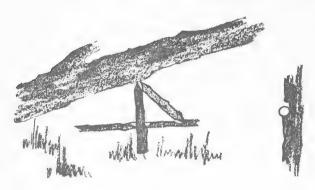
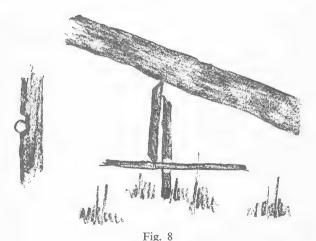


Fig. 7



15.

horizontal sticks more sensitive. A V-ledge should be cut at the end of the horizontal, baited stick and the tip of the diagonal pointed so that point rests on point; the upright is not notched but squared off to receive the horizontal and should have an almost flat base so as to fall quickly. A modified and more sensitive variation of the figure-4 trigger and one more easily set is at Figure 8.

Two rockfalls are shown at Figures 9 and 10. In the former the baited, notched peg at the base of the tree in the illustration slips from a ledge cut into the base. The rock should in fact be placed much lower than in the illustration. The rock pitfall at Figure 10 is operated by an animal falling through a cover of leaves. It would be not only stunned but impaled on the sharp-

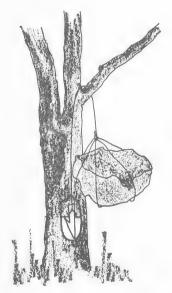




Fig. 9

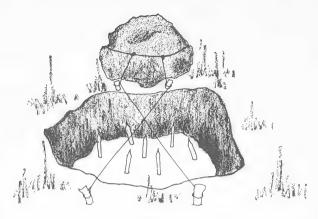


Fig. 10

ened stakes and crushed by the balanced rock upset as the crossed strings are struck. In some soils water may be substituted for the stakes.

Remember—animals caught in snares and traps often die lingering and painful deaths. Never use them if you can possibly avoid it. If you have to build them, inspect your traps daily and be sure to destroy them when they are no longer needed.

#### CHAPTER IX

# TRACKER AND QUARRY

Tracking represents the ultimate in bushcraft skills. No book on the bundu would be complete without a chapter on it. Some knowledge of tracking is needed by every infantry soldier and by any proficient Boy Scout. Too often, however, patrolling for the soldier or the scout is "a long walk and a perfunctory search". Systematic and careful search is necessary to make

contact with any quarry.

Tracking calls for definite qualities, such as unusually keen eyesight, memory, common sense, fitness and a love and understanding of nature, and the ability to concentrate over prolonged periods. Practice and experience can make the average man a fair tracker but the really outstanding trackers appear to have been born with the latent ability. Generally speaking, the best trackers in Rhodesia are the rural Africans who have developed and used tracking skills since childhood through hunting animals or finding strayed stock. The urban African is a poor tracker, as is the average European, and the skill of even the rural African tends to be localised. If an African has developed his skill in a particular district, his abilities do not show to advantage in other areas, his knowledge of vegetation and "bump of locality" being much diminished outside his own area, with the possible exception of the Kalahari Bushman.

Like any other bushcraft skill, tracking can be learned by the European provided he has the interest and will exercise his intelligence and common sense. Patience, persistence and acute observation are the basis of good tracking. The skill is best acquired by watching a skilled tracker at his job, then trying to put the main principles to work through practice and still more

practice.

The first principles of tracking are:

- a) Identification of the spoor and establishment of a definite starting point.
- b) Flexibility and anticipation.
- c) Sign interpretation before speed.
- d) Preservation of the spoor.

Expert trackers apply these principles in various ways. Usually, upon encountering tracks, some small period of time must be spent in studying them to determine, for example, when the quarry passed the spot, the direction of its movement and, in the case of human quarry, the number and whether or not loads are being carried. If possible, this starting point should be fixed on the map.

Having established a starting point, the tracker proceeds, looking well ahead for speed but being careful not to miss a change of course by the quarry, not to allow himself to be misled by red herrings and not to spoil the trail through his own carelessness. He tries to identify the trail positively by some distinguishing mark in order not to lose it in any similar spoor.

Animals do not conceal their tracks. These have characteristics peculiar to each species which, when known to the tracker, make animal hunting comparatively easy. Following blurred human footprints is much more difficult than tracking the well-defined hoofprints of game. Tracking is easier in the morning and evening, as the cracks or shadows cast by ridges in the spoor stand out better than at or near midday. The shadows show up best if the spoor is between the tracker and the sun.

Observation is flexible, one method being discarded in favour of another as appropriate. The tracker's observation may change continually from one sort of sign to another, switching perhaps from footprints on a soft patch of earth to the reflection of light from disturbed foliage, then to dislodged stones or leaves.

Trackers work best in pairs, leapfrogging when the trail is faint, the man having the run of the track keeping it until the spoor is lost or he is tired—and tracking is a tiring business—

the man behind watching for tracks breaking off to left or right. Should both lose the spoor, they will search the obvious spots for sign and, if unsuccessful, work in a complete circle for a fresh lead in case the quarry has doubled back.

Things the tracker will look for are:

- a) Footprints and impressions of footwear; the rhythm of the spoor or length of stride of the quarry, as a guide to where the next footprint can be found.
- b) Trampled grass.

c) Disturbed stones, sticks or soil and cracks in the soil where

indirect pressure may have left no impression.

- d) Leaves turned, crushed, kicked or pulled off trees; branches and twigs bent or broken; vegetation pushed aside and the reflection of light from grass or leaves, displaced at an angle; the colour of bent and broken vegetation; scratched or chipped bark
- e) Discarded wrappings and masticated vegetation.
- f) Cobwebs broken or obviously wiped off on to the nearest tree or bush.
- g) Urine and excrement, frequently indicated by houseflies, mopane bees and yellow butterflies, and by dung beetles during the rains.
- h) Snares and traps, robbed bees' nests and smoke.
- i) Signs at fruit-bearing trees and observation points.
- k) The state of the dew on a trail.
- 1) Mud displaced from streams; mud or scratches on stones and logs.
- m) Moss scraped from trees.
- n) Disturbed game or birds; the spoor of running animals not disturbed by the tracker is often a good indication that other humans have been in the locality.

When disturbed, elephants trumpet or rumble through their trunks; antelope and buffalo stare fixedly after and sometimes follow intruders. Certain birds, too, can be an embarrassment to quarry or tracker. One of these is the grey loerie or "go-away" bird. This is a common and conspicuous bird about 18-20 inches long, dull grey in colour and with a prominent crest. A source of annoyance to trackers and hunters, when disturbed it utters a loud and drawn out "g'way" call and often follows the intruder, thus alarming the quarry or warning the tracker.

The appearance and calls of the two larger honey-guide birds have already been described.

The two varieties of oxpeckers are most frequently found near game, particularly buffalo, upon which they clamber about looking for ticks and blood-sucking flies even if the animal is wounded. Both types are about eight and a half inches long, dark brown above and lighter beneath, one having a yellow beak and pale rump, the other's beak being red. When approached, they will fly up and about the animals or may even line up on their backs but in any event will protest. The yellow-beaked variety utters a hissing alarm note and the other either a warning rattle or hissing "tsee".

It is comparatively easy to deduce the direction of movement from clear foot impressions or even from flattened grass but rather more difficult across hard or stony ground. The tracker will therefore watch for the direction in which leaves, stones, etc., are kicked forward, cobwebs wiped off on to trees and the splash direction of water, blood and saliva, all of which splash forward. Finally, the tracker is constantly alert to the possi-

bility of ambush and to anti-tracking tricks.

Trails—There are many paths in the bundu, invariably made by game during their nightly or seasonal movement. Since these animals avoid steep, slippery slopes it will be found that these tracks provide very easy going. For this reason the human quarry will use them both for quick, silent movement and for ambushes. Well-defined tracks are formed by game along main ridges for movement from one part of the country to another. These are usually joined by contour trails leading from shallow valleys round the head of the valley. In addition, ill-defined

trails follow small spurs projecting from main ridges into the deeper valleys.

Tracks—Due to the fact that most animals have cloven hooves, their footprints have sharp, clear-cut edges. A man's barefoot prints are soft, rounded impressions formed by the toes, ball of the foot or heel. Women's tracks tend to be smaller, splay-toed and pigeon-toed. Points which indicate a running man are skid marks, the depth of impression, toe and ball of foot-marks only, splayed-out toes and damaged vegetation with lack of concealment. Load-carrying men usually take shorter steps, leave deeper impressions than normal in soft ground and tend to splay their toes.

Age of Spoor—Only an experienced tracker can establish the age of spoor with any accuracy. Sun, wind and rain may erode or blur the trail rapidly but a knowledge of local conditions, such as a recent shower or the strength of the previous day's wind can be helpful in estimating the age of the sign.

In assessing the age of spoor, the tracker must consider: a) Weather—The effects of rain, dew or guti and of water seepage: by recalling when last it rained a better assessment can be made; if the tracks are badly pock-marked, they were made before the rain and if not marked were made after the rain; the same principle can be applied to tracks pock-marked by mist dripping from trees: the tracker always notes the state of dryness of a track in mud or soft ground; if the spoor is very fresh, water will not have run back into a footprint; later the water runs back and still later any mud pushed up round the depression and any kicked forward as the foot left the ground begins to dry: the effect of wind on the edges of an impression. b) Vegetation—The colour and suppleness of trampled or broken vegetation, remembering that while the thin portions dry out quite soon, the leaf stalk remains supple for some time; various grasses have, however, different resilience and only with experience will you be able to use this factor for accurately iudging the age of a track: the dampness of torn bark.

- c) Superimposed Animal Tracks—The impressions of animal feet and particularly those of nocturnal animals superimposed on the spoor of the quarry: most animals lie up by day and move about during the night; so if the spoor you are following has animal tracks superimposed and these tracks indicate movement of game in both directions, you may take it that the spoor of your quarry is at least one night old; if the animal tracks indicate movement in only one direction, the trail of your quarry was probably made during the night after the animals had moved to water or salt licks but before they had moved back.
- d) Urine and Excreta—Urine patches: the damp patch of fresh urine ages into a hard crust. The condition of excreta, which when fresh is covered with mucus which dries rapidly; the mucus on elephant dung dries in about an hour if exposed to direct sunlight.
- e) Shade—The position of trees and bushes relative to sun and spoor in view of the shadows they may cast on the spoor for long periods of the day. During the heat of the day a human or an animal resting will do so in the shade; the position of the sun relative to the marks on the ground will be an indication of their age.
- f) Leaves Covering Track—In the bundu, leaves are always falling, the number depending on wind and rain. By looking at the number of leaves on the spoor and taking into account the recent wind and rain, yet another indication of the age of the track can be obtained.

Factors Affecting Tracking—In addition to the age of the trail and the effects of the elements, the factors which determine the ease or difficulty of tracking are:

- a) Whether the ground is hard or soft, stony or muddy.
- b) The type of country—savannah or mopane forest.
- c) The weather—things lack depth in overcast weather; the position of the sun relative to the direction of travel.
- d) The footwear of a human quarry.

e) The extent to which other similar tracks may confuse and the possible blurring of the spoor in rich game areas.

f) Concentration and the effect of weariness upon it.

Learning to Track—Having obtained a teacher in the form of the best available tracker, get someone to lay a fairly easy trail over various types of country. Arm the tracker with a pointer, get him to indicate each sign as he finds it and follow him over the course.

Repeat several times over different courses, then have another trail set and do the tracking yourself with the expert behind, pointing out the signs you miss—and at first there will be many. Repeat over progressively more difficult country and if possible over several months to cover both dry and rainy seasons.

Take every opportunity to track game. This stimulates interest and contains some small element of risk. Elephant provide a ready source of tracks in the more remote areas.

Anti-Tracking or Concealment of Tracks—Whether you are learning to track or wishing to conceal your own trail and confuse a tracker, it is essential that you familiarise yourself with the various anti-tracking methods.

### These include:

- a) Europeans going barefoot, wearing sandals cut from rubber tyres or, better still, soft, round-soled shoes without treads.
- b) Walking on the sides of the feet to leave no toe or heel marks.
- c) Walking on the edges of or astride paths.
- d) Stepping in one another's tracks which tends to disguise the numbers in a gang; sometimes the rear man will cut off the feet of dead elephant, buffalo or other game and tie them to his feet to obliterate the human spoor; this is especially effective for crossing roads, dry stream-beds, etc: alternatively, he may cover the tracks with leaves or even, on game trails, pull down a bush with ample foliage to cover the track in the hope that this will be interpreted as having been done by big game.

- e) Watching the country carefully and finding the most difficult tracking routes; walking along fallen trees or over rocky ground and stepping from rock to rock; avoiding paths and tracks.
- f) Splitting a gang into individuals or small groups over easy tracking ground.
- g) Tying shoes on back-to-front or walking backwards, mainly in soft or dusty ground. This can be detected by observing that the heel mark tends to be deeper than that of the ball of the foot and that the feet are placed wider apart although the pace is shorter; mud flakes are kicked up by the heel instead of the toe.
- h) In the case of stolen cattle a favourite trick is to split the herd and mix it with the herds of other farms. When they are on the move, broken bush is dragged over the trail.
- j) Using a stick to bend grass back in the opposite direction. k) Crossing streams, etc, by trees and rocks and avoiding water as a line of march
- I) Being careful in the use of fires, smoke, tobacco and soap (in water); noting possible sources of bird and game alarms and sudden insect silences.
- m) The familiar tricks of tip-toeing or setting false trails.

Tracking humans who are always trying to conceal their tracks is difficult even for an experienced African tracker, although individual gangs tend to use typical methods of concealing their tracks or hideouts.

For this reason the only near-perfect tracker is the trained tracker dog.

The dog is trained to follow human ground scent, whether of European, African or any other race. It will normally follow the freshest track but, if given the scent from clothing or belongings, can discriminate and follow the scent of their owner. Once you have decided to use a tracker dog, you must ensure that the trail is not confused and all unnecessary movement in the area must be controlled until the dog is away on the scent.

Everyone gives off a scent peculiar to himself alone. This

mingles with the smell of his clothing, equipment and footwear and combines with the scent of disturbed earth, bruised vegetation and crushed insects caused by his movements to give a conglomerate scent which the dog follows. Obviously the composition of the scent is constantly changing, first one element predominating, then another. When it consists mainly of earth, vegetation, etc, the dog may switch to a different quarry if a similar scent crosses that which he was following.

Factors which contribute to a good scent are:

- a) Approximately similar air and ground temperatures.
- b) Dull and damp weather.
- c) Dirty body and clothes.
- d) Blood, sweat and panic.

A scent is adversely affected by:

- a) Heavy rain, strong wind, hot sun and dust.
- b) Rocky or stony surfaces and metalled roads.
- c) Running water.

Under favourable conditions, a dog can follow a track 12 hours old but sometimes there may be virtually no scent even if

the quarry is just a few minutes ahead.

If the dog is to be properly handled and to give of his best, he must start work fresh. This means that although he must be close up and available for immediate use, he must not be made to walk long distances before actually starting work. A point to remember is that a fit dog can go on longer than can his handler. A tired handler may therefore unknowingly pull the dog off the scent, knowingly discourage him from following the track through dense bush and over hard going or even say that the dog is tired or the scent has petered out.

The efficiency of the dog is in direct proportion to that of his handler but a dog is not a machine, and is as liable to have an

off day as his handler.

#### CHAPTER X

### POINTERS TO DIRECTION

East may be East and (somewhat obviously) West may be West but you may be reluctant to move without a compass.

Whether you have force-landed, baled out or simply got yourself lost, sit down quietly and take stock of yourself and your surroundings. Although you may be lost, you should know exactly your points of departure and destination and have some idea of the direction in which you should be travelling to reach the latter. If you were flying, you will also know your approximate ground speed and time on course and have a rough idea of the area in which you have landed.

Next, make your way to the nearest high point and study the surrounding terrain in a full 360° circle, noting all prominent features and objects. If you have a map, using your knowledge of your approximate position, relate the surrounding landscape to it. Orient the map by picking out a prominent object which can be identified on it. Draw a line on the map between the object and your approximate position. Turn the map so that the pencil line points towards the object on the ground.

If you have no map, draw a rough one on a piece of paper or on the ground—and memorise it before you leave the spot. Note the position of the sun, the direction of tree shadows and of the prevailing wind and relate your course to them. Choose features such as hills along the route you wish to follow, then travel from feature to feature, keeping a record on your mapor by memory.

It is important to keep a sense of direction and to be aware of the fact should you lose it. Should the particular feature towards which you are travelling, the sun or shadows of trees appear to be out of position, you have lost your sense of direction. This often happens at midday, when the sun is directly overhead, or on days when it is obscured by clouds.

The enormous communal nests of the Red-billed Buffalo Weavers are always built on the West side of trees. A handsome bird about nine inches long, the male is black with white edges to the primary wing feathers; bill, legs and feet are orange; the female is duller, especially beneath, and has a whitish throat. They are very noisy gregarious birds, six to eight pairs each having nests in the colony, which also includes "cock" nests, and there may be several colonies to the tree.

The Stripe-breasted Sparrow-Weaver also builds its nest only on the West side of trees. These are sparrow-like birds about seven inches long, both sexes having light brown backs, white eyebrows and rumps; bills are blackish, legs and feet brown. Nests are large, round, untidy bundles of dry grass.

Both species are common in the Zambezi valley.

Approximate direction can be found by one of the follow-

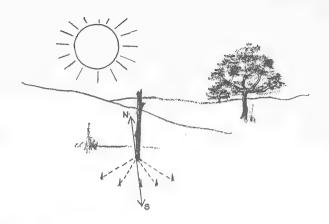
ing methods, by day or by night:

1. At Sunrise or Sunset—As the sun rises in the East and sets in the West, you can find North by observing the sun at dawn or dusk. At dawn, stand with your back to the rising sun and raise your arms shoulder high. Your right arm will be pointing approximately to the North and your left to the South.

2. Stick and Shadow—Erect a straight stick as nearly vertically as possible on a flat piece of ground. Check its alignment with a plumbline improvised from a weight tied to a piece of string, a tie or a belt. About an hour before noon mark the position of the end of the shadow thrown by the stick. Do this every 15 minutes until the shadow is clearly lengthening. A line drawn from the stick to the end of the shortest shadow is the North/South line. Between 14 November and 29 January, the line will point North and, during the rest of the year, South. This is because Rhodesia lies between the Tropics of Cancer and Capricorn and the sun reaches its zenith either North or South of the country, depending on the time of year.

3. Watch Methods

a) Stand with your back to the sun so that your shadow is



exactly before you. Turn your watch so that the figure 12 points to the middle of your chest. A line bisecting the angle between the hour hand and the figure 12, and extended before you, will point South throughout the year except during the period 14 November to 29 January, when it will point North. b) A less accurate method, but one which is simpler and can be used on the move, is to face the sun, turning the watch so that the figure 12 points towards it. North is then approximately on the line bisecting the angle between the hour hand and the figure 12. From 14 November to 29 January the line will, of course, point South.

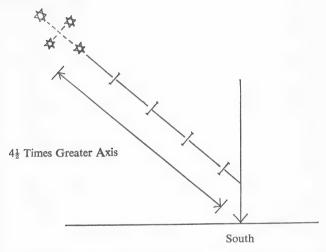
One way of maintaining continuity of direction is to walk with the sun constantly on the right shoulder. Look back frequently, rest often and study your progress and the ground you have covered. Before settling down for the night, draw a line on the ground into and beyond your camp, following the line of your march.

After dark, look to the heavens for help.

4. Southern Cross—This is the most distinctive constellation in the Southern Hemisphere. Don't confuse it with a nearby large cross known as the False Cross, with more widely spaced

but less bright stars. The False Cross has five stars, including one in the centre, whereas the True Cross has only four; two of these, on the Southern and Eastern arms, are among the brightest stars in the sky. Consider the Southern Cross as a kite; prolong the greater axis four and a half times in the direction of the tail and the point reached will be approximately due South.

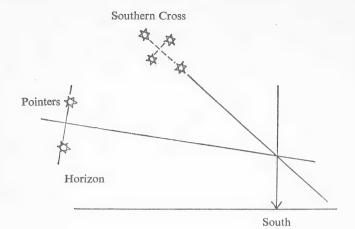
#### Southern Cross



- 5. Southern Cross and Pointers—There are two very bright stars just to the East of the Southern Cross, known as the Pointers. Using True Cross and Pointers, South can be found as follows:
- a) Extend the greater axis of the Cross.

b) Join the Pointers and bisect the line with another at right angles.

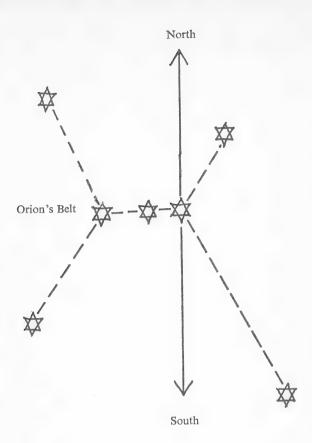
c) The intersection of this imaginary line with that drawn through the Cross is approximately over the South Pole.



6. Orion's Belt—The constellation of Orion consists of seven stars of which the three closest together are called Orion's Belt. The star through which the North/South line passes in the illustration is exactly on the Celestial Equator. This star always rises due East and sets due West of you, no matter where on earth you may be.

It is emphasised that these are only approximate methods of establishing direction, requiring clear days or nights to put into practice, and are no substitute for a small simple compass, although they may provide a useful check on any variation.

If you have a compass, apply the feature system to your compass course and choose two prominent trees or other objects exactly on the bearing you wish to follow and as far apart as possible; before reaching the first point, select a third in the same straight line; on reaching the second, pick a fourth and so on. Look back at intervals, firstly to check that you are travelling in a straight line and secondly so that you will recognise the features should you have to retrace your steps.



#### CHAPTER XI

### CAMPING IN COMFORT

To the uninitiated, the bundu is synonymous with discomfort. Being comfortable, however, is only a matter of taking a little trouble over the small things which contribute to well-being.

The first essentials of suitable camp site, shelter and a fire. with sufficient water and food to ensure survival, have already been covered.

In siting camp-fires and latrines, note the prevailing wind to ensure that you are not affected by smoke or smell. Avoid sleeping on or close to the ground if possible, especially in winter when the earth can be considerably colder than a spot three to four feet above it. Improvise a three-point hammock. Alternatively, use convenient trees or cut and erect forked uprights and cross-pieces to make a "four-poster" bed.

If you do have to sleep on the ground, avoid sandy areas which lose heat rapidly and can be colder to sleep on than a clay type soil. Furthermore, sand packs somewhat solidly and makes for an uncomfortable night. Unless you take much trouble over it, a grass bed may be uncomfortable, as the cold penetrates both from the top and underneath. Make a thick mattress, then bend a good quantity in the middle and place it over yourself, starting at the feet. This should give you a warm bed in which you will be able to turn over without disturbing it very much. If you have a fire, keep green grass or leaves handy to throw on the fire to keep mosquitoes away.

Sleep under a well-tucked-in mosquito net if you have one. This will keep out not only insects but such unwelcome visitors as spiders and snakes. Sleep with your head towards the fire. If disturbed, you will be able to see further into the darkness

with the fire behind you.

If you are a soldier on patrol, the minimum scale of equipment you will carry is normally laid down in Unit Standing Orders. How you pack it is important, because a soldier who cannot find a particular article in his pack in the dark can be a nuisance on patrol. Develop the art of methodical packing and, when an article has been used, return it to the proper place. This will ensure that your patrol can move at any time without delay.

In a survival situation, keep all your clothes. See that what you wear is free and easy on the body and carry any surplus for protection against night chills. Wear long-sleeved shirts and trousers in preference to shorts and sports-shirt. If it is necessary to discard clothing, keep a shirt in preference to trousers. Wear a cap or hat; if you have neither, improvise one.

If, after making a thorough appreciation of the situation, you have decided that, on balance, it is better to travel for help than to remain where you are, then prepare carefully for the move. Plot your route and follow the simple rules outlined in the chapter on finding direction. Gather your kit together and decide what you want or must take with you and what can be discarded. Most people have their own ideas of what is and what is not essential, and certainly very few soldiers think alike on what is important.

A suggested "survival kit" is described. Your priorities, however, should be: a filled water bottle, sheet of transparent plastic, first aid kit, knife, matches, heliograph mirror, weapon and food, headgear and spare socks. The bare essentials are

knife, plastic sheet and matches.

Move in the cool of the day and rest in the shade between 11 a.m. and 3 p.m. Conserve your strength and take at least a ten-minute rest every hour when on the march. The rest should be a real one; either sit or lie down, as relaxed as possible, in the shade. If there are more than one of you, count heads at every halt and travel at the speed of the slowest man in the party.

Night falls swiftly in Rhodesia, so set up camp well before sunset. Avoid walking in river beds. You will soon become tired walking in the sand, clambering over boulders and making detours around reeds. In any case, farm homesteads and kraals—for which you will be looking—are always set back from the river's edge and could easily be by-passed.

It is most important to keep your feet in good condition. Your footwear should be comfortable, not new. Don't try to break in a new pair of boots on a patrol; on the other hand, the soles should not be badly worn. Footwear, like the survival kit, is largely a matter of personal choice. The ordinary Army boot takes a lot of beating but some soldiers will wear hockey boots or even tennis shoes for preference. Soft round-soled half-boots, without treads, are best for anti-tracking purposes. Should you have lost your shoes baling out in the crash, don't try to walk barefoot. Improvise footwear from your parachute harness and cloth. Simple shoes can also be devised from skins of game. In wet weather, dry your footwear in front of a fire but don't place them too close to it or they will stiffen and crack.

Always carry a spare pair of socks and wash your feet and socks frequently. Feet should be properly dried and foot powder used if available. Socks and boots should be removed when you halt for the night, to allow them to dry out, and replaced by a pair of sandals. However, before going to sleep, put your boots on again but do not tie the laces.

If your feet hurt, stop and attend to them. Inspect them for rub marks and blisters; tape or bandage rub marks; clean the skin around a blister, use a sterilised needle to puncture it at its outer edge and press out the fluid, then bandage.

Keep yourself and your clothing clean. Use an antiseptic

on all insect bites and on cuts and scratches.

Your enforced change of diet, and the nervous tension which often accompanies a survival situation, may bring on diarrhoea or excessive looseness of the bowels. As corrective measures, sterilise or boil all water before drinking, cook plant food or wash it in purified water before eating. Wash your hands before eating. Dig and use proper garbage and latrine pits well away from camp and the water supply.

Eat nothing for 24 hours, but drink as much water as you can spare. After your one-day fast avoid sugars and starches and eat only liquid foods. Eat frequent small meals instead of two or three large ones—and drink plenty of water until your condition corrects itself.

There are many ideas on what should and what should not be included in a "survival kit". Space and weight considerations are important factors both to the pilot of an aircraft and to the often heavily-laden soldier.

An ideal list would include the following, in order of

priority:

Item

Filled water bottle Large sheet of transparent plastic sheeting First aid kit

Knife

Waterproof container of matches with flint bar, or lighter
Heliograph mirror
Rifle and ammunition
Rations
Headgear
Spare socks
Marching compass

Comprising/including

Triangular bandage, adhesive dressings, heat exhaustion tablets, chalk and opium tablets (diarrhoea), APC tablets ('flu, headaches), snakebite outfit, malaria prophylactic, antiseptic ointment.

Panga, sheath or Boy Scout knife.

Soft cap in preference to hat.

Magnifying glass Water purifying tablets Cooking fuel tablets Sheet of aluminium foil Sheets of toilet paper Fish hooks

Wire for fishing traces and 6 feet.

snares

Nylon cord 20 feet. Mosquito netting 1 yard.

Foot powder

Sandals

Torch Fresh batteries.

You may consider eye lotion more important than foot powder.

The following are desirable additions:

Additional filled water bottle
Dark glasses
Sunburn cream
Maps
Pliers (for the snares)
Small aluminium pot
Insect repellant
File or whetstone

Tinned food is always bulky and heavy but if you are on patrol it is probably included in the rations you are carrying. Your survival kit should include, as emergency rations, soup and beef extract cubes, biltong, salt, tea and barley sugar sweets.

Although unappetising, stewed meat or corned beef mixed with cooked sadza (mealie meal) and compressed into a plastic bag provides a nourishing, filling and lightweight, pre-cooked

ration for a long patrol.

Carrying your survival kit will present a problem if you have baled out or crashed but you can make a suitable rucksack from your parachute gear. Adjust the pack to ride as high as possible on the shoulders, the straps padded if necessary to prevent their cutting into the armpits or neck.

Remember that the fundamental and most important factor

in a survival situation is the will to survive.

## "COMMON SENSE"

... Compulsively, the man turned to run, then he checked. "Stand still," said reason. "If you disturb an animal, to run away is the worst thing you can do!"

He froze, half in the shadow of the tree. The elephant moved restlessly, then turned aside on to a game path through the

long grass.

The man looked at his bleeding arm. With a strip torn from his tattered shirt, he bandaged his padded handkerchief over the wound, pressing firmly on to the dressing. The bleeding stopped and he put his injured forearm into his unbuttoned shirt for support.

"Get back to the plane," said reason. "You had a full water bottle in the cockpit." He moved painfully back to the fork in the trail. In the distance he could hear the elephant pulling

down branches off the trees.

The man felt exhilarated. His head had cleared and he was now calm and sure of his next move. "Common sense," he said to himself, "Use your common sense—don't die in the bundu."

#### APPENDIX I

### EDIBLE PLANTS

Although the edible fruits may be refreshing, even thirstquenching, and add balance to your diet, many of them have an astringent effect and are of limited food value. Further, in most cases they are to be found only towards the end of the rainy season. For bulk in your vegetable diet, you are advised to look in preference for the edible roots and African spinaches which have a wide distribution and are available throughout the year.

Adansonia digitata-Baobab, cream of tartar, kriemetat

boom, umKomo (N), muUyu (S), (see page 100).

The baobab is a large tree with a smooth, brown bark and stiff branches found in the hot, low rainfall areas. It may grow up to 70 ft. high and have a diameter of 24 ft.; the swollen trunk of a well-grown tree is familiar to most Rhodesians though the slender young leaf-clad tree is not so well known.

The alternate, bright green leaves are divided into 5-7 leaflets borne on long, brownish, grooved stalks; each leaflet may be three to five inches long but the centre one is always the largest. The large white flowers appear in October or November and, while attractive, smell of meat extract and are probably fertilised by "bluebottle" flies.

The hard-shelled fruit is carried on a long stalk and may be six inches long by four inches in diameter; a velvety greygreen shell covers a dry, whitish pulp, astringent but refreshing, especially when pounded and mixed with water; embedded in the pulp is a number of dark seeds which are pleasantly acid and refreshing to suck and may be roasted and ground to make "coffee".

The fresh leaves are boiled and eaten as a vegetable and pieces cut out of the trunk provide a little moisture if chewed; water often collects in the hollows which form in the bole. The fruits contain very high concentrations of Vitamin C which makes them even more desirable to those with an unbalanced diet. The entire young plant can be eaten, and the bark of the sapling can be used for making a good rope. It will be plain that this tree is one of the most useful which can be found by anyone with a survival problem.

Bidens pilosa-Black jack, Mhuvuyu (S), Nyamaradza

(Zezuru), (see page 101).

This is a very common annual weed. The leaves are usually divided into three leaflets, each up to one and a half inches long, stalked, spearhead-shaped and with irregularly toothed margins; undivided leaves are not uncommon. Flower heads have a yellow centre, sometimes surrounded with white rays. Seeds with two to four barbs at the apex. The cooked leaves are a good substitute for spinach.

Brachystegia boehmii-Prince of Wales feathers,

umTshabela (N), muFute (S), (See page 102).

The dominant tree in most parts of Rhodesia between 3,500 and 4,000 feet, but occurring also at higher altitudes, it may grow to a height of 40 ft. with a trunk diameter of two feet but is usually much smaller. The bark is irregularly furrowed,

rough and grey.

The leaves are copper coloured or green when young, divided into oblong leaflets in 14-24 pairs, so close together as to overlap and almost stalkless, oblong and slightly tapering; at the base of the leaves there is often a pair of kidney-shaped leaflike appendages up to two inches long. The flowers are rather inconspicuous but have long white anther filaments and appear between September and December. The fruit is a flat, smooth, brown seed-pod appearing between May and June.

The tree provides a very good rope bark which is most durable and may be used for making fishing traps; the bark is stripped in long, narrow lengths, then alternately chewed and

rolled until it is soft and pliable.

The inner bark is quite tasty and will stave off thirst on the march.

Boscia albitrunca-Witgatboom, umBombwe (N), muTobi,

muDowe (Gwanda dialects), (see page 103).

This is a small tree found mainly in the Southern lowveld and Matabeleland. It has a whitish trunk which, with its compact, rounded head, makes it easily recognisable at a distance. The inch to inch and a half long leaves are alternate, leathery, grey-green, oblong and crowded at the end of the branches; leaf stalks are short and the midribs are channelled above and prominent below. The flowers are minute, the fruits round, the size of a small cherry and though edible are slimy and have a sickly sweet taste. However the roots (muTiri) can be pounded and made into porridge, roasted and used as a coffee substitute or boiled for a long time to make syrup.

Commiphora marlothii-Paper bark tree, Quoquodo (N),

(see page 104).

A tree commonest in the hotter and drier parts of Rhodesia, common too on granite kopjes in Matabeleland and the North-West of the country. It is easily recognisable by its bark which flakes off in large, light golden-yellow sheets and comes off twigs also like yellow paper, leaving a smooth, green underbark. The leaves, up to eight inches long and bunched at the end of thick twigs, are each divided into 5-9 hairy and almost stalkless, oblong, scalloped leaflets, woolly below, where the midrib and veins show clearly.

The small whitish male and female flowers appear on separate trees in November and December before or with the young leaves, followed by round, one-seeded fruits. The edible roots are quite palatable raw.

Commiphora mollis—imiNyela (N), (see page 105).

A smallish, attractive, leafy tree with a round, muchbranched crown found in the lowveld and throughout the hotter and drier types of woodland; common in river valleys at the lower altitudes. It has a smooth, brown or dark grey bark, sometimes mottled with circular patches of lighter colour about the size of a half-crown; the trunk is often roughly four-sided or furrowed. Leaves are alternate, often in clusters on short branchlets and are compound of 7-9 leaflets; these are oval, grey-green in colour, about an inch long by half an inch wide and covered with silky hairs.

The small, pinkish or yellowish flowers appear about the same time as the young leaves, in October or November. The fruit is round and green, about the size of a Cape gooseberry and consists of a single seed with a thin fleshy covering. The edible roots are tasty either raw or cooked.

Commiphora mossambicensis-Paper bark tree, imiNyela

(N), muTaswa (S), (see page 106).

A shrub or small tree up to 18 ft. high, sometimes with suckers, found most commonly in the hotter, drier parts of Rhodesia; it is also found on both level and stony ground and its distribution reaches Salisbury.

Like C. marlothii, this species is found on granite kopjes; the bark is smooth, brown or dark grey, contains a resinous sap, and flakes off in yellowish patches with a papery texture.

The alternate leaves are divided into three to five leaflets, usually clustered at the end of branchlets; the overall length of the leaf is up to six inches of which half is a thin stalk; leaflets are as broad as they are long, tapering to sharp points, and are fringed with fine hairs; there are conspicuous veins and midribs, especially on the undersurfaces of leaflets; leaves go brown and fall off after the rainy season. The small, yellowish-white flowers appear, male and female on separate trees, at the end of the dry season with the new leaves. The round, fleshy fruit is the size of a cherry with one large seed with an orange-red covering at its base, gripping the seed by four narrow arms. The edible roots are palatable raw or cooked.

Coleus esculentus—African potato, scrambled egg, Tsenza (S), (see page 107).

A perennial found all over Rhodesia, often on stony ground.

It has stems two to three feet long, arching over.

The leaves are opposite, nearly stalkless, roughly oblong, more or less scalloped, covered with soft hairs on both surfaces. Clusters of bright yellow flowers are borne in the leaf

axils on the bare stems remaining from the previous year; another form of this species, with erect stems and leaves, and flower clusters in whorls of three, is not distinguished by the African under separate names. The root is an artichoke-like, edible tuber which is tasty either raw or cooked.

Dioscorea bulbifera-Air potato, iDiya (Ndau), (see page

108).

This is a fairly common climber with slender stems and alternate, hairless, heart-shaped leaves with about nine veins arising from one point at the base. The stems bear aerial, kidney-shaped, brown tubers which are edible.

Hyphaene ventricosa—Gingerbread palm, fan palm, vegetable ivory, iLala (N), muRara (S), Ngumba (Tonga), (see page 109).

This is a slender palm up to 70 ft. tall, often in belts along lowveld rivers but under less favourable conditions may be a small shrub with leaves arising at ground level. It has a smooth trunk sometimes slightly swollen above the middle, with the leaves at the apex, fanlike, composed of many narrow segments separated by fibres, the margins and upper sides of the veins rough to the touch.

The small flowers are borne on tapering branches in the leaf axils. The fruit is a hard, nearly spherical, polished brown nut about three inches in diameter, with a hard, ivory, onion-shaped seed. The sweet fibrous coverings make good chewing and elephant are very fond of them.

The apical buds or shoots are a useful source of food and a

potent wine is distilled from the tapped sap.

Lannea edulis-Wild grape, boomdruif, iTagabomvu (N),

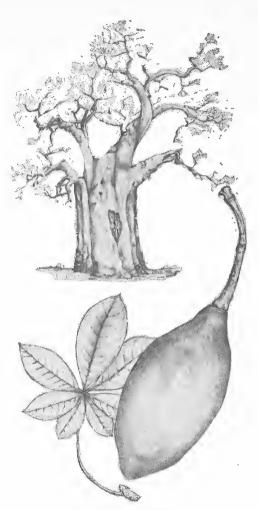
muTsambatsi, muHute (S), (see page 110).

A common perennial found everywhere in Rhodesia. Most of this dwarf shrub is underground in the form of a large, woody rootstock up to five inches in diameter; above ground there are only a few inches of branchlets bearing leaves; there may be a number of clumps of stems in a four to six foot radius, usually all growing from the underground branches of one plant.

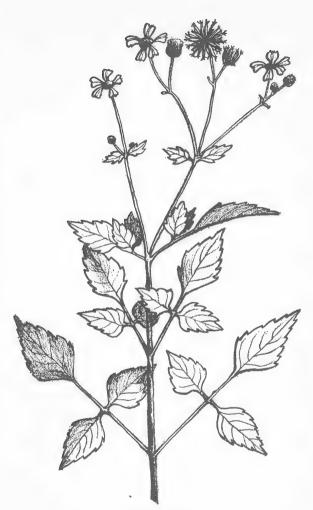
Leaves follow the flowers and grow erect up to 16 inches long. They have from five to seven opposite, oval leaflets, almost stalkless and up to five inches long by two and a half inches wide, covered with dense reddish-brown hairs when young, particularly beneath.

The small, creamy -yellow flowers are borne in short clusters at ground level. The edible fruit is half an inch long, scarlet ripening to black. It has little flesh but is juicy and sour when red, sweet when black. The edible root must be cooked before

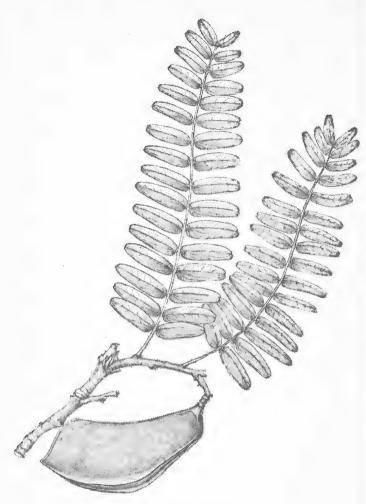
eating.



Adansonia digitata



Bidens pilosa



Brachystegia boehmii



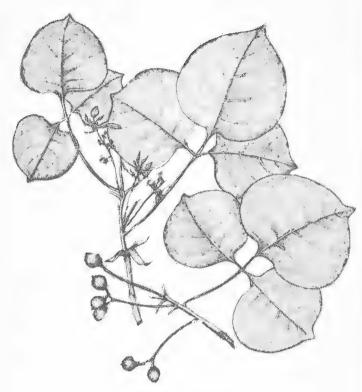
Boscia albitrunca



Commiphora marlothii



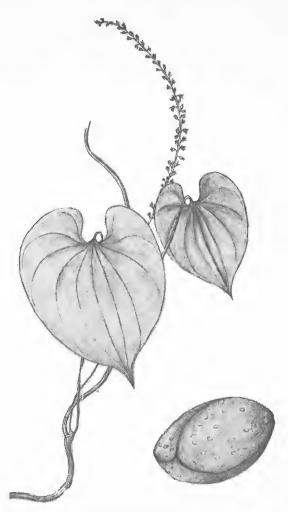
Commiphora mollis



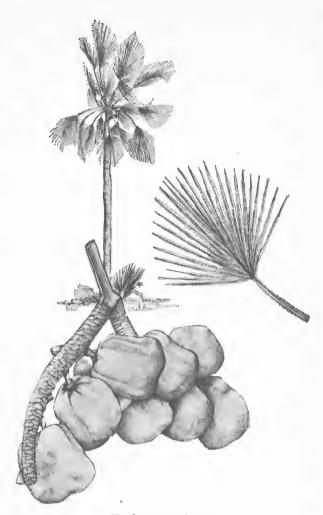
Commiphora mossambicensis



Coleus esculentus



Dioscorea bulbifera



Hyphaene ventricosa



Lannea edulis

## APPENDIX II

## EDIBLE FRUITS

Carissa edulis—amaTungulu, umLugulu (N), muJabvane (S), muMbingwa (Zezuru), muNzambara (M), muRavamombe (Ndau), (see page 117).

A bush or small, rounded tree commonly found on ant heaps or in dense types of vegetation everywhere in Rhodesia. It has markedly forked branches with a pair of spines actually

growing at many of the forks.

The leaves are opposite, the blades being somewhat heart-shaped with an unbroken margin, growing on every stalk; they are leathery and may or may not be covered with soft hairs. If the stems or leaves are cut they release a milky latex. The tubular, pink and white flowers appear in clusters at the ends of the branches.

The fleshy, edible fruit is red, turning purplish-black when

ripe; the milky, red pulp is sweet and pleasant to eat.

Diospyros mespiliformis—Rhodesian ebony, jakhals bessie, umDhlausu (N), muChenje, muShuma (Zezuru), (see page 118).

This is an evergreen tree, very large in the lowveld along rivers but smaller in the highveld where it is usually found on termite mounds. The bark is rough, dark with small, quite

regular scales and when slashed shows a pink scar.

The short-stalked leaves are alternate, shiny and oblong, rounded at both ends, three to six inches long by one to two inches wide, sometimes with a wavy margin. Hairy, brown flowers grow in the leaf axils. The round, yellow, tough-skinned, edible fruit is borne in a large, shallow, five-armed cup; the sweet, mealy pulp surrounds dark brown, shiny seeds to which baboons and monkeys are partial.

Its common English name is derived from the very hard,

heavy, purplish wood.

Ficus capensis—Cape fig, groot vy, muWonde, muKuyu (S),

muKowana (Ndau), (see page 119).

The Cape fig is usually a short, rounded tree, though it may reach 40 ft. in height, and the trunk is usually about two feet in diameter. It has a milky sap and a smooth grey bark.

The smooth leaves are alternate, heart-shaped with wavy and coarsely toothed margins, up to six inches long by three inches wide, sometimes hairy beneath, especially on the veins, and borne on stalks up to three inches long; leaves seem to shed throughout the year and it is not uncommon to see a leafless tree in midsummer or new leaves appearing in the winter.

The smooth and fleshy figs are borne on leafless branches from the main stem, spherical or top-shaped, tapering abruptly towards the base; pinkish-green when ripe, sometimes with dark blotches; soft and tasty though often crowded with ants.

Flacourtia indica-Batoka plum, umQuokolo, maBota (N),

muDendweya, muNhunguru (S), (see page 120).

This may be a spiny shrub or small tree with rough, brownish bark. The leaves are carried on very short, pinkish stalks and may be alternate or clustered on the short branches, dark green in summer, reddish or purple-tinted in the autumn; they are rounded at the apex and narrowed gradually to the base, have a midrib prominent below, at least a partially toothed margin and may be hairy. The twigs may carry spines up to two inches long and sometimes leaves grow from the spines.

The yellow male flowers cluster in the leaf axils; a few female flowers, small and greenish, grow singly in the leaf axils. The edible, fleshy fruit is a half to one inch diameter berry, red to purple when ripe, with several seeds in a pleasantly acid

pulp.

Garcinia livingstonei-African mangosteen, muRorongwe,

Sina (Tonga), (see page 121).

The African mangosteen is a medium-sized tree, common on the fringes of lowveld rivers, particularly in the Zambezi system. It is easily recognisable from a distance because of its stiffly branched, straight stems rising above the other riverine vegetation. The slashed bark and broken twigs and leaves produce a yellow latex.

Branchlets and leaves are often in whorls of three; leaves are dark green, leathery and hairless, two to three inches long by one to two inches wide with short stalks and prominent veins beneath; they are wedge-shaped with unbroken margins. Cream-coloured flowers cluster on the second-year wood, particularly on the short lateral branches.

The edible ripe fruit is an orange-yellow to red fleshy berry, up to three quarters of an inch long, containing between one and five seeds. It has a pleasantly acid taste and baboons,

monkeys and night apes are especially fond of it.

Parinari curatellaefolia—Cork tree, hissing tree, Mobola plum, boomgrysappel, umKuna (N), muHacha, muChakata (S), muShakata (M), muMbhuni (Ndau), mBula (Tonga),

(see page 122).

The Mobola plum is a common, medium-sized to large tree with a straight bole and a rough, dark, corky, deeply fissured bark which is however reticulated and often made thinner and blackish by frequent veld fires. It is usually found on sandy soils where water is fairly near the surface and is widespread throughout the high and middle veld.

It has a dense and rounded crown of dark foliage. The hard, leathery leaves are short-stalked, oblong with flat or wavy margins; the undersurface is pale and has prominent veins; the short, thick stalk is covered with dense, brown hair.

The sweet-scented, reddish-brown flowers bloom in dense clusters. The oval fruit is about an inch long, has a rough skin ripening to dull brown in early summer and has an acid-sweet, mealy pulp, which with the seeds is edible and contains much Vitamin C.

Sclerocarya caffra—Marula, iGanu, iKanyi (N), maRula, muTsomo, muPfura (S), muFuna (Ndau), (see page 123).

A well-known, tall, deciduous tree, the Marula is common in the lowveld and Matabeleland, especially near Bulawayo and Plumtree but also fairly common in medium altitude areas such as around the Umtali and Fort Victoria areas. It has a rounded. spreading top and a thick, fairly smooth, grey bark which flakes in older trees.

The leaves are alternate, crowded at the ends of branchlets and divided into 7-13 leaflets on longish stalks; the leaflets are more or less oblong with tapering points, shiny above and paler and grey-green below. The yellowish or pinkish flowers are very small and appear in stiff clusters with the new leaves, mainly during October.

The fleshy, stoned fruit is two inches or more in diameter, spherical, pale green ripening to pale yellow early in the dry season, very juicy and tasting somewhere between a mango and

a litchi; the nut within the stone is delicious.

Syzygium guineense-Water tree, waterberry, waterboom, iGuali (N), muKute, muRgwi (S), chiMo, muKute-tembo (M), (see page 124).

A medium-sized tree found along rivers and near springs all

over Rhodesia. It has a grey or blackish bark.

The leaves are opposite, elliptic, tapering to both ends, dark green, leathery and with gland dots which are clearly visible when the leaves are held up to the light. The edible, purplish fruit is the size of a small plum and has a very pleasant taste.

Syzygium cordatum-Water tree, waterberry, waterboom, umDoni, umSwi (N), muKute-shenje (S), muNonyanansi

(Tonga), (see page 125).

A tree of similar appearance to S. guineense and found also in damp places as a rule. It has a dense, dark green foliage. The apparently stalkless leaves seem to clasp the twig and are smooth and leathery, oblong with veins channelled above and prominent below; like S. guineense, the leaves have translucent gland dots. The edible fruit, too, is similar to that of S. guineense.

Tamarindus indica-Tamarind, muSeka, muSika (S), (see

page 126).

The Tamarind is a handsome tree up to 70 ft. tall, found only in the Zambezi valley, usually near rivers in deep valley soils. It is a dark-looking tree with rough, dark grey, furrowed

bark with a pink slash.

The leaves are alternate and divided into 9-20 pairs of leaflets, each oblong, grey-green and up to an inch long by a quarter of an inch in width. When in bloom this tree is a mass of beautiful yellow or red-mottled flowers. The sausage-shaped fruit, up to five inches long, is fleshy, covered with a brown or grey shell. The edible, sticky, brownish pulp is eaten raw, tasting rather like sherbert but having a laxative effect. It tastes particularly good with curry.

Uapaca kirkiana—Wild loquat, maHobohobo (N), muZhanje (S), muShuku (Karanga), muTongoro (M), (see

page 127).

The maHobohobo tree is common on the Rhodesian plateau at altitudes between 3,000 and 5,000 feet. It is a small tree with a rough, dark grey, furrowed bark and rounded crown.

The large, dark green leaves are alternate and crowded at the ends of the branches; they are oblong with unbroken, wavy margins; up to eight inches long, they are borne on stiff, hairy stems; the undersurface has brownish hairs. The round, yellowgreen flowers appear in close clusters on the old wood below the leaves.

The rounded, edible fruit, up to an inch and a half in diameter, is borne in clusters close to the stem and contains several whitish seeds; the fully ripe berries are brown and fleshy, juicy and very good eating; they ripen best if picked and kept in the dark for several days; the fruits are collected and sent for sale to markets in districts such as Matabeleland where the tree does not grow.

Ximenia caffra—Sour plum, suur pruim, umTunduluka (N),

muNhengeni, muTswanzwa (Zezuru), (see page 128).

This is a common and widespread shrub, often seen on termite mounds. The branches are thorny, the leaves and branchlets densely covered with reddish-brown hair when young. The short-stalked leaves are oblong, rounded at both ends, the upper surface dark green and shining, smooth when old, the

undersurface often brownish hairy. The small white flowers appear singly or in close clusters on the short side branches.

The ovoid or oblong, fleshy, stoned fruit is bright red when ripe and should be squeezed into the mouth, leaving the skin outside. The roots soaked in water produce an infusion said to cure bilharzia.



Carissa edulis



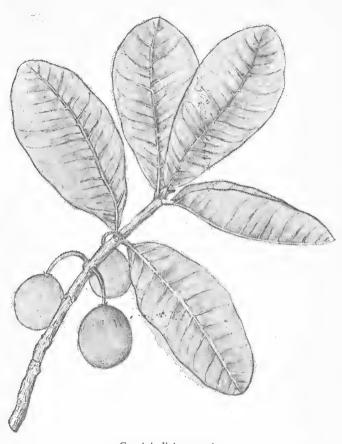
Diospyros mespiliformis



Ficus capensis



Flacourtia indica



Garcinia livingstonei



Parinari curatellaefolia





Syzygium guineense

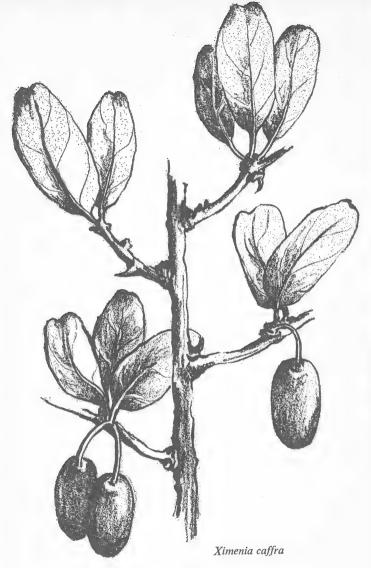


Syzygium cordatum





Uapaca kirkiana



## APPENDIX III

## POISONOUS FRUITS AND PLANTS

There are relatively few really poisonous fruits. In general, avoid fruits having smooth yellow or green skins and thorns on leaves or stems, dark purple fruits from plants with milky juice but no thorns, or fruits from plants growing carpet-like close to the ground. Do not eat melons or similar fruits if the first taste of the central pulp is bitter and the fruits of plants having swollen roots may also be poisonous. Treat the various species of kaffir orange as suspect unless you are quite certain of the edible ones.

Acokanthera oppositifolia—Bushman's arrow poison, (see page 134).

A rigid-looking bush or small tree, six to eight feet high; though not very common, it is found by streams or rivers and in Eastern District forests, sometimes on relatively dry sites such as the Matopos.

It has opposite, elliptic, evergreen leaves, each pair being at right angles to the next; the midrib is channelled above, prominent below and ends in a straight, sharp point; the leaf blade is smooth, leathery and glossy green, the edge thick and rolled back. Flowers are clustered in the axils of the leaves, tubular and pink without, white within.

This shrub has a milky juice and no thorns. Its ripe fruit is purplish-black, egg-shaped and about half an inch long. The fruit is to be avoided and the sap is poisonous either swallowed or introduced into the blood stream through a wound.

Adenia senensis—Baboon poison, bobbejaangif, (see page 135).

This plant grows from a swollen, underground tuber which is sometimes partly exposed. Its slender, twining stems have tendrils from the leaf bases. Leaves are alternate, greyish-green

and very variable in shape, but are more or less lobed and always have two glands at the base of the leaf on the stalk. The fruit is yellow to orange, oblong, about one and a half inches long by an inch in width and divided into three partly hollow compartments, each containing a soft, yellowish pulp in which are embedded reddish, pulpy-looking seeds. Despite its attractive appearance the fruit is known to have been responsible for several deaths.

Capparis tomentosa—muKanyengwe (N), (see page 136).

A spiny, climbing shrub, common in the lowveld and occasionally found on termite mounds in the highveld. Leaves are alternate, stalked and oblong-elliptical, rounded or notched at the apex, covered with grey down, especially beneath. The greenish-white flowers bloom singly in the axils or in loose clusters. The fruit has a hard brown shell, is round and up to an inch and a half in diameter. Although monkeys and birds eat this avidly, it is poisonous to humans.

Cucumis species-Wild cucumber, wilde komkommer.

Wild cucumbers grow well in dry regions, their fruits being adapted to water storage. Although many of the cucumbers are edible, bitter fruits do occur and these are poisonous.

a) Cucumis anguria, variety longipes, (see page 137).

A slender-stemmed annual vine with dense white hairs on stems and leaves, which are in consequence rough to the touch.

It is widely distributed throughout Rhodesia.

The leaves are alternate, with large, rounded lobes and two to four inches long, dark green and on stalks up to an inch and a half long; tendrils up to an inch long and tightly curled at the tips arise from the leaf bases. The ripe fruit is yellowish-green to light yellow, covered with soft, thick prickles and the size of a hen's egg. The translucent, green flesh smells like cut cucumber and is a valuable source of water. However, there are bitter-fruited varieties which are poisonous and for this reason this species appears among the poisonous fruits.

b) Cucumis metuliferus, Jelly melon, muTete (S), muGumudza'mbwa (Zezuru), (see page 138).

A tendrilled creeper, it is widely cultivated but is also common in old lands and on roadsides. In its wild form it is often a climber over bushes and trees.

The stems are angular and covered with stiff hairs, the leaves alternate and, like the stems, rough and hairy with three to five rounded or sharp lobes and irregularly toothed margins; at the bottom of the two-inch stalk a coiled tendril appears. The flowers are yellow and resemble those of the cucumber.

The fruits, when young, are dark, mottled green and covered with spines which are rather fleshy and not very hard; when ripe they are orange and about five inches long by two and a half inches in diameter. The rind is thin and the flesh green and translucent. Eaten raw or cooked, but the bitter strains are poisonous.

Datura stramonium—Thorn apple, Jimson weed, stinkblaar,

Chohwa (S), (see page 139).

A robust weed found in arable land or disturbed ground of any type. Growing up to four feet in height, it has alternate, heart-shaped to elliptic leaves, up to six inches long by five inches wide, with irregularly-toothed margins. Single flowers bloom in the leaf axils, with a tubular green outer covering and white to bluish trumpet-shaped petals up to three inches long. The fruit is a woody capsule, containing many poisonous seeds and covered with short, hairy spines.

Dichapetalum cymosum—Gifblaar, blaasgif, makgou,

umKauzaan, Ncusane (N), (see page 140).

This plant is frequently found at the edges of vleis or in savannah woodland, mainly confined to the Kalahari sand areas of Matabeleland to the North and North-West of Bulawayo. It is a ground plant having the main, woody portion underground. The plant may cover many square yards, seeming to consist of separate, crowded clusters of branches but in reality growing from a common root system. Stems are up to two feet high, reddish-brown and erect.

Leaves are alternate, up to four inches long and one and a half inches wide, stalkless, smooth and leathery; the veins are prominent and loop before the margins; the young leaves are hairy but the hairs wear off with age. The flowers are small and greenish-yellow with inconspicious, forked petals and are borne on very short flower stalks in the axils of the leaves.

The round, orange-brown, ripe fruits are loquat-like in appearance, about an inch long and have a soft velvety skin containing two large seeds covered with a little flesh. Fruit

and leaves are very poisonous.

Manihot esculenta—Cassava, muFarinya (S), (see page 141). A widely cultivated plant frequently found growing around African huts throughout Rhodesia. The leaves are divided into 3-7 narrow, pointed leaflets up to six inches long. The small flowers grow in clusters. Both leaves and the long, tuberous roots contain a poisonous glucoside which releases prussic acid.

The tubers may be:

a) peeled and boiled, then eaten after throwing away the cooking water,

b) peeled and dried thoroughly, then ground into a meal or

c) roasted thoroughly and ground into a meal.

Solanum species—Bitter apple, thorn apple, monkey apple,

bitter appeltjies, (see page 142).

Solanums have purple to mauve or pink flowers with a prominent yellow centre. Perhaps the most common species—Solanum incanum, umDulukwa (N), muNhundurwa (S)—is a spreading bush, up to four feet in height, found on waste land and roadsides throughout Rhodesia.

It has brown to grey stems and branches, hairy and with strong, hooked spines. The leaves are alternate with wavy margins, grey-green and hairy, especially beneath, and have hooked spines. Flowers are usually purplish and rarely white, like those of a potato. Ripe fruits are smooth, round and

yellow, up to one and a half inches in diameter and poisonous,

especially when unripe.

Solanum aculeastrum, Dungwiza (S), muTura (M) is a spiny shrub often used for kraal fences. The bark is grey and foliage whitish and dusty-looking. Leaves are alternate and deeply lobed; the leaf blade is dusty-green above and covered with dense, white, downy hairs below; the short stalk and prominent lower veins carry thorns. The apple-sized fruit is yellow when ripe and resembles a tomato. It is poisonous.

Strychnos species—Kaffir orange, umHlali, iHlala, umWawa

(N), muTamba, muZumi (S), see page 143).

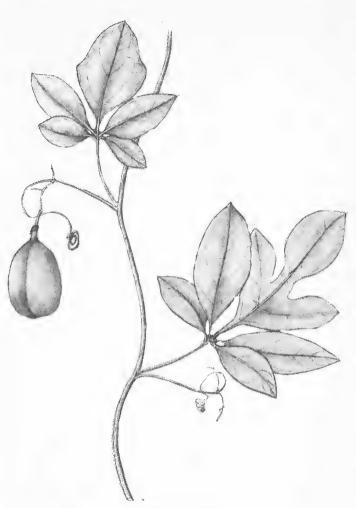
There are several species of strychnos having fruit varying from half-inch berries to four-inch "oranges". The pulp of some may be palatable but generally unless you are absolutely certain of these, treat the fruits as suspect.

The commonest species—Strychnos spinosa—is a tree having a smooth grey bark which when slashed shows yellow with green edges. Young twigs may end in a spine and twigs often carry short, paired and opposite, hooked spines.

Its oval leaves are simple, opposite, pale green and soft with between three and five veins rising from the base; leaves are smooth with wavy margins but may have patches of silky hairs in the angles of the veins below. The hard-shelled fruit ripens from green to yellow or pale brown and may be up to four inches in diameter. It contains a yellow-brown, acid pulp which in the fully ripe fruit is quite palatable. The seeds of unripe fruit should never be eaten.



Acokanthera oppositifolia



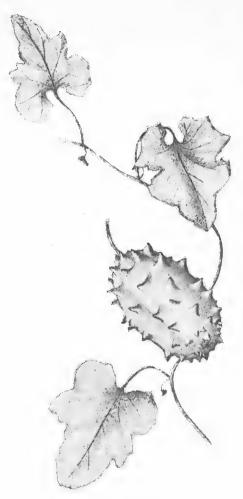
Adenia senensis



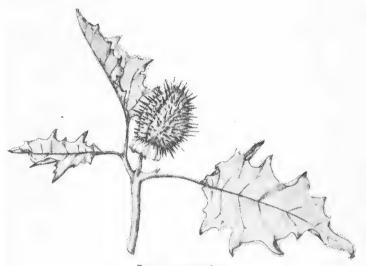
Capparis tomentosa



Cucumis anguria



Cucumis metuliferus



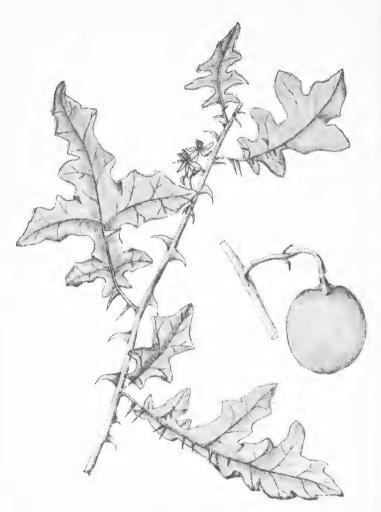
Datura stramonium



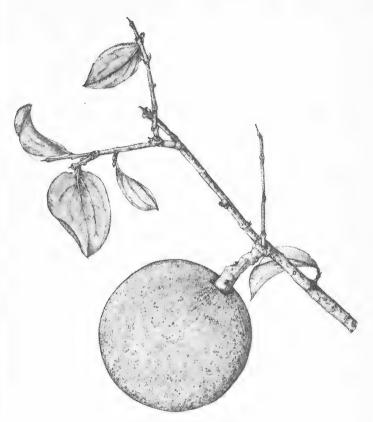
Dichapetalum cymosum



Manihot esculenta



Solanum aculeastrum



Strychnos spinosa

#### APPENDIX IV

#### VENOMOUS SNAKES

Dendroaspis polylepis polylepis—Black, black-mouthed or brown mamba, iMamba emnyama, iginyambila (N) Rovambira, Nzayo (S).

The black mamba is the largest and most feared of the venomous snakes, with an uncertain temper. Nevertheless, though quick to bite if molested, and especially bold in the mating season, it is not generally an aggressive snake.

It has a long, narrow head with vertical sides and largish round eyes. It is a slender snake, though the central portion is fairly thick; body scales are smooth and narrow. In colour, it is greyish-green to olive-grey at birth, darkening with age to dark olive or brown, gunmetal or greyish-brown above; underparts are greyish-white, often tinged with yellow or green, frequently with darker specks on the rear half of the belly and under the tail; the eye is grey to brown with silver edging to the pupil.

The average length of an adult is eight feet, although specimens up to ten feet long are found in the Matopos where they

are known as iginyambila.

It prefers the lower-lying, drier and more open bush country at altitudes not more than 4,000 feet. It usually confines itself to a particular locality where it may live for years if undisturbed. It makes a permanent home in deserted termite nests or animal holes, under tree stumps or among the rocks and boulders of stone kopjes which it may share with other snakes, not necessarily of the same species. When disturbed in the open it tends to make straight for its home and may attack an intruder in the way. It has keen sight and in view of its size, speed of movement and ability to strike in almost any direction is a most formidable enemy. Any untoward movement or sound will cause it to rear off the ground, ready to strike, mouth



Dendroaspis polylepis polylepis (Black Mamba)



Naja nigricollis mossambica (Mozambique Spitting Cobra)



Naja haje haje subspecies annulifera (Egyptian Cobra (Banded variety))



Hemachatus haemachatus (Ringhals)

slightly open and tongue flickering. When really angered the neck expands to form a small, modified hood. Its venom is a powerful neurotoxin which causes death within minutes. Immediate difficulty in breathing is followed by the collapse of lungs and heart.

The black mamba moves over rough country very swiftly, silently and gracefully with the fore-end raised well off the ground. This snake is very fond of basking in the sun, often on an open slab of rock or a tree near its home. It feeds mainly on birds and small mammals, especially rodents, but will also eat lizards and other snakes. In the rural areas it sometimes enters houses to look for rodents.

Dendroaspis angusticeps-Eastern green mamba.

The green mamba is shy and much less aggressive than the black mamba and when startled does not gape its mouth or move its tongue. Its head is similar to that of the black mamba but in general build it is lighter and very slender, tapering towards head and tail.

Bluish-green at birth but after first shedding its skin the head becomes bright green and this colour extends further back with successive sheddings until, from the time it attains a length of about two feet, it is a uniform bright green. Adults are bright green above, yellowish-green beneath but, before shedding the skin, the back may turn a dark bluish-green; the eye is olive-green, pupil edged with yellow; inside of mouth white or bluish-white.

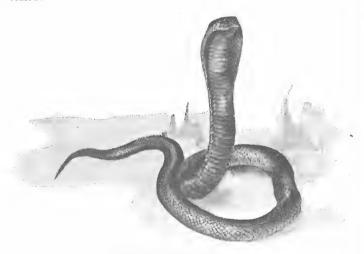
Smaller than the black mamba, its length seldom exceeds seven feet. Essentially a tree snake, it is seldom seen outside forest or thick bush and, in Rhodesia, is restricted to the Eastern Districts. It lives mainly on birds and their eggs, rodents and the tree-living lizards.

Cobras-iPhimpi (N), Mhungu (S).

Cobras are widespread and common in Rhodesia. They grow to fairly large and massive proportions, six to seven feet being the normal average length. All are quick moving, active and agile, inquisitive and intelligent. They are recognised by

their inclination, when disturbed, to hiss loudly, rear up and, by expanding the ribs, to spread the neck in a menacing hood. It is characteristic of the cobra group that they rear up and, when the head is raised off the ground, can flatten or expand their necks to form a hood which may be two or three times the normal width of the neck.

In all species of cobras the head is not very distinct from the neck and the body tends to be cylindrical to moderately flattened.



Naja melanoleuca (Forest Cobra)

Naja melanoleuca—Forest cobra.

The head of the forest cobra is usually brown above, the forward half of the body light to dark brown with black flecking, usually passing to uniform shiny black on the rear half, sometimes the body and tail shiny black throughout, its glossy appearance being a distinguishing characteristic; beneath, it is bright yellow, heavily speckled or blotched with black; the lips yellow with black edging.

Adults are usually six to seven feet but may exceed eight feet in length. The longest and most active and intelligent of the African cobras, it is usually restricted to rain forest areas but also occurs along the Inyanga trout streams. It is a good fisherman and fish is a very important item in its diet which also includes small mammals, amphibians, lizards and other snakes.

Naja nigricollis mossambica—Mozambique spitting cobra, swartnek kobra, spuugslang, iPhimpi (N), Mhakure (S).

This is one of the most variously coloured of African snakes but the local form is slate-grey to olive-brown, light to dark brown above, often with black-edged scales and the skin between the scales black; beneath pink to yellowish, with irregular black bars and blotches across the throat. The scales are dull and satiny.

The average size of the local form is four feet but it may occasionally exceed five feet. It is probably the commonest cobra of the savannah regions of Rhodesia and it prefers localities near water. It lies up during the day in termite nests or animal holes, but often comes out to bask in the sun.

One of the most dangerous snakes in Africa, it can spit its venom, squirting a jet of droplets through a venom hole on the front of the fang so that it goes forwards and upwards. The snake actually aims at the eyes of its enemies and can squirt its venom accurately for distances exceeding eight feet. Not injurious to the skin, this venom, if it gets into the eyes, produces a burning sensation and if not washed out immediately can cause serious damage and even blindness. Should you get the venom in your eye, use whatever you have to dilute or neutralise it—milk, water or even urine.

When confronted at close quarters, this snake may rear up to a considerable portion of its length, spread its hood and spit in defence but may do this from ground level without rearing. It sometimes shams death until danger is past.

It eats almost anything—small mammals, birds, frogs and toads, lizards, snakes, eggs and insects.

Naja haje haje-Egyptian cobra, banded cobra, Egiptiese

kobra, lappieslang, bosveld geelslang, iLoyi (N), Nyamafingu, Pfungaure (S).

This is a snake with a misleading name, having a wide distribution at the higher altitudes. It is found in a wide range of shades of brown or yellow, most frequently uniform yellowish to olive or greyish-brown, pale to dark brown or blackish above, old specimens usually dark brown or black; beneath, yellowish to yellowish-brown, usually blotched with brown but sometimes dark to blackish-brown throughout; scales beneath the tail often edged with dark purplish-brown to black; except in the specimens uniformly dark beneath, there is a broad dark band across the neck; in young specimens the under surface is white to yellowish with a black neck band.

A handsome banded variety occurring in Southern Africa, mainly in Rhodesia, is marked as follows; head and neck dark brown or black, followed by up to 17 alternating broad bands of yellow or cream and dark brown to black over back and tail—the pale bands two to three inches wide and the darker bands three to six inches—in adults often completely encircling the body.

The average length of adults is five to six feet but eight foot specimens have been recorded; unlike most other species of snakes, the male is larger than the female. This is the most massive of our cobras and is widespread in non-forested areas at altitudes up to 6,000 feet, being the commonest cobra at higher altitudes. Not an aggressive snake but one which presents a formidable front when disturbed, rearing up to two feet from the ground and spreading a hood which may measure as much as five inches across. Its venom is a powerful neurotoxin.

These snakes prefer permanent or semi-permanent homes in termite hills or holes in the ground or under rocks and boulders, where they may live for years if undisturbed. Mainly ground snakes but able to climb trees to seek their prey. They will bask in the sun in the early morning near their homes. Feeding on small mammals, lizards, snakes, frogs, birds and their eggs, this species is very partial to toads.

Hemachatus haemachatus—South African spitting cobra, ringhals (rinkals), spuugslang.

The ringhals has a short, broad, deep head with a prominent and bluntly pointed snout. The scales on the body are strongly

ridged.

In Rhodesia, the ringhals is yellow to olive-grey with a black head and irregular narrow black rings on body and tail; the throat is banded in black and white. The South African form is usually blackish, dappled or with irregular cross bars or bands of creamy white to pale brown or grey; or brown above, sometimes spotted with black; the underside is dark brown to blackish, usually with one or two pale crossbands on the neck, the forward band being narrower than the rear one; pale markings fade out with age and old specimens are often uniformly black; sometimes yellowish to greyish-blue beneath with dark bands on the throat.

The average size of the Rhodesian form is three and a half feet but South African specimens up to four feet in length have been recorded. In Rhodesia, the ringhals is confined to the Inyanga highlands and is uncommon even there. It is however common in the Eastern Cape and Transvaal.

When disturbed suddenly in the open, the ringhals will rear up to face the intruder, hood expanded and displaying the black throat and vividly contrasting white crossbands. It is however only really aggressive when disturbed in the mating season and at other times is usually anxious to avoid an encounter.

If unable to escape, the ringhals may sham death, turning on its back, becoming limp and allowing the jaws to gape; in this state it will allow itself to be picked up and handled without showing signs of life but keeping an eye directed towards its enemy and always alert to strike if an opportunity offers.

Its fangs are even better adapted than those of the spitting cobra for spitting its venom forwards and upwards; the poison is squirted in a fine stream from both fangs up to a range of seven feet. The newly ejected venom is almost colourless but dries to yellow. It has an instantaneous smarting and watering effect on the eyes, causing severe inflammation followed by rapid destruction of the eye tissue and blindness, unless immediate action is taken to wash out the venom with a bland solution.

Its vision is poor and it appears to rely mainly on smell for finding a wide range of prey of which it prefers rodents, toads, lizards and other snakes.

Dispholidus typus typus—Tree snake, boomslang, inDlondlo (N), korakunda (S).

The head of the tree snake is short, blunt and roundish, the neck slender. Scales are strongly ridged. There are greater variations, according to locality, in the colour markings of this snake than in any other species, which accounts for its various names in different parts of South Africa, including green, brown or black tree snake.

Youngsters are usually ash grey to greyish-brown to brown above, with darker and lighter spots, the lighter spots often bluish in colour; beneath, yellowish to pinkish-grey, speckled with different shades of brown; upper lip yellow, large eye brilliant emerald green. In adults, females are usually light to dark or olive-brown above, sometimes with a darker stripe and with sides grey and mottled with brown or scattered bluish spots; beneath, greenish-white to yellowish or greyish-brown. Males are generally leaf-green to bright or olive-green above, scales sometimes edged with black and often with black spots on the head; lighter green to yellowish-green beneath, some scales on the sides tinged with blue. Depending on the body colour the eye of the adult may be grey or brown. The average length of the species is four to five feet.

Essentially a tree snake, it has a long and slender build enabling it to glide silently and with almost incredible speed and grace through the branches of trees and bushes in which it spends most of its time. However, despite its name it often descends to the ground to bask in the sun, to seek food,

cross gaps between trees or bushes and to lay its eggs.

Like the twig or vine snake, it can remain perfectly still for long periods, even with much of its body unsupported and, with its wonderful camouflage, merges so well into the surroundings as to be virtually invisible—to the extent that birds may perch on it. It is slower on the ground and, when disturbed there, moves for the nearest bush into which it disappears in a flash. It is also a powerful swimmer and will cross narrow rivers to raid the weaver-birds' nests hanging from trees on the opposite bank.

A mild-natured and unaggressive snake which usually tries to escape when disturbed. If cornered and frightened it gives ample warning by swelling its neck and sometimes the forward part of its body. It has an extremely potent venom causing bleeding from internal organs.

Its favourite diet is tree lizards, including chameleons but it also eats small birds, mice, frogs, birds' eggs and fledglings.

Thelotornis kirtlandii capensis, Thelotornis kirtlandii oatesi—

Twig, bird or vine snake, Kotikoti (N), Hukute (S).

In both colour and shape this snake is admirably suited for tree living. It has a long, narrow, pointed head, very distinct from the slender neck and varying above in colour from green in adults to pinkish-mauve or violet or pinkish-brown in juveniles, sometimes with forked black markings, the arms extending above the eyes, which are very large with horizontally elliptical pupils; usually a dark streak runs from behind and below the eye, widening to the mouth; the upper lips are pinkishwhite, speckled with dark brown or black. The body and tail are grey or pinkish-brown above, uniform or in different shades of lighter and darker blotches or bands, often on the sides only; the underparts are greyish, speckled with brown, lightly over the forward third and more darkly over the rear two-thirds of the body; chin and throat are creamy, speckled with brown to black, sometimes massed to form an irregular band. The tongue is orange or scarlet and black-tipped.

Adults are usually three to four feet in length. With long

head and body and a slender tail, this snake is well adapted for its arboreal life but can move with considerable speed not only through the foliage of trees and bushes but also on the ground in the savannah country which it favours. The mixed greys, browns, pinks and greens of its colouring give it perhaps the best camouflage of all the Rhodesian snakes, especially as its favourite resting place is along a branch with the forward third projecting twig-like into space. It can remain so, rigid and unmoving, for long periods. When disturbed, these snakes adopt a threatening attitude by distending the throat and forepart of the body, which accentuates the colouring and presents a frightening appearance.

Though often called bird snakes, they prefer reptiles, particularly chameleons and small snakes. Blessed with very keen eyesight, when they recognise their prey they approach it by advancing the head very slowly, keeping it raised and swaying from side to side like a twig in the breeze; when within range

they strike like lightning.

Although this snake is inoffensive and very seldom bites humans, its venom is as potent as that of the boomslang, with similar effects.

Adders—In adders the head is usually broad and very distinct from the neck, flattened and covered with small scales; the eye fairly small.

The body is thickened to very fat, the tail very short. Normally a most sluggish family, seldom moving out of the way of intruders, preferring to remain still and give warning by a loud puffing or hissing. Their diet consists mainly of warm-blooded prey. There are eight species of which those described here are all found in Rhodesia.

Bitis arietans arietans—Common or African puff-adder, pof-adder, iBululu (N), Chiva, Mvumbi (S).

This is probably the most common and widespread of our snakes. It has the flattened, very broad and heart-shaped head of vipers, distinct from a rather thin neck and covered with small, overlapping scales.



Dispholidus typus typus (Tree Snake (Boomslang))



Bitis caudalis (Horned Adder)



Bitis atropos atropos (Berg Adder)



Bitis gabonica gabonica (Gaboon Viper)



Causus rhombeatus (Common Night Adder)



Causus defilippii (Snouted Night Adder)

In colour, it may vary from yellow to orange-brown above with distinct, fairly regular dark brown to black chevrons down the back, pointing towards the tail, or dark brown to black with yellow to orange markings; a large well-marked dark blotch covering the crown of the head, a dark band beneath and another behind the eye, which is fairly small and varying from golden to silver grey.

Beneath, the snake is uniform yellowish-white, usually with scattered dark spots. Its colour becomes very dull just before shedding its skin but is at its brightest just afterwards. The average length of adults is two to three feet. The snake has a flattish, thickened body, with a very short tail especially in the case of the females which are however the more massive.

Found mainly in the savannah areas and common around human dwellings, it is very sluggish but dangerous because its camouflage makes it difficult to see, especially in the long grass, and a victim may tread on it and be bitten before being aware of its presence; for this reason it is especially dangerous to grazing stock. The puff-adder is responsible for 75% of all snakebites by adders in Rhodesia and of these five per cent prove fatal.

Its name is derived from its habit, when disturbed, of inflating itself with air which it lets out with a loud puff-like hiss. It can strike forward or sideways with astonishing suddenness and speed. Essentially a ground snake, it sometimes climbs into bushes and shrubs and is quite at home in water. It is particularly active at night when it seeks its food which is for the most part toads and such small animals as rats and mice in preference to birds, lizards and frogs.

Its venom is as deadly as that of the cobra or mamba but it is slower-acting and may take up to twenty-four hours to cause death; local tissue destruction, often leading to amputations, is the more usual result of a bite.

Bitis caudalis—Horned puff-adder, horned adder, side-winding adder, horingadder, inDlondlo (N).

The head of this species is covered with small, overlapping,

ridged scales of which there is usually one erect and horn-like above each eye.

In colour, this snake is variably light to sandy grey, fawn to reddish, greyish, bluish or dark brown above, with three series of darker spots, comprising a spinal row of squarish, dark brown to blackish spots which may be pale-edged or pale-centred, sometimes with grey patches between the spots; along each side a series of smaller, pale-centred and sometimes pale-edged dark spots, alternating with the spinal row or opposed to form irregular bands; between these are brown to greyish-brown spots; there is a broad, V-shaped, dark marking on the back of the head and a dark spot on each side; beneath it is uniform yellowish-white, mostly with scattered dark markings along the lip. Average length is eight to ten inches.

It is common in the South-Western part of Rhodesia, where it is restricted to the drier, sandy and stony parts. It will hiss loudly if disturbed, at the same time curling up and drawing the head back to strike. It buries itself in the sand with only the eyes and top of the head exposed. When on the surface, will flatten itself and remain quite still to escape notice. Its diet is mainly lizards, especially gekkos which abound in its habitat and which it attracts when buried in the sand by exposing and

wriggling its tail.

Bitis atropos atropos—Cape mountain adder, berg adder. The head of this snake is broader than the neck but is fairly long and covered with small, overlapping and ridged scales.

In colour the berg adder is greyish-olive to greyish or dark brown with two rows of large, pale-edged, almost triangular black marks; a broken white to yellowish line runs along either side, edging a row of similarly shaped but smaller, dark, paleedged markings below on each side; between upper and lower rows of spots is a series of forked dark markings, the tops joined and the bases connected by flattened triangular blotches to form a series of rough circles, each containing a dark spot; there is a broad, arrow-shaped black marking on top of the head, the point forward between the eyes, and two pale streaks on each side of the head, upper lips heavily marked with black; beneath, chin and throat are pink fading to yellowish-white spotted with black mainly towards the lips; the belly and beneath the tail dirty white with dusky markings, or uniformly pale to dark slate-grey or black paling towards the sides.

Adults average twelve inches in length, the body becoming fat and very stubby. The tails are longer in males than in females. This snake is common in the Chimanimani Mountains and Inyanga highlands, found usually in open grasslands. Most bad-tempered if disturbed, when it hisses and strikes viciously. Its diet is mainly rodents and the nestlings of ground-living birds but it also eats lizards and other snakes.

Its venom is of the neurotoxic type and a bite should be

treated promptly if the patient is not to die.

Bitis gabonica gabonica—Central African gaboon viper,

koning pofadder.

This is probably the most beautiful of all adders, with a colour design like that of a Persian carpet, yet the overall effect, to those who dislike all snakes, remains sinister and repulsive.

It has a very broad, triangular head covered with small, lightly ridged scales, two enlarged horn-like scales being sometimes present between the nostrils. The head is cream to chestnut above with a dark brown central line and on either side a dark brown triangular blotch behind the eye widening towards the mouth; the eye is silver grey, pupil vertically elliptical. Above, the ground colour of this snake is of shades varying from brown to purple, on which is a series of oblong yellow to light brown patches alternating with hourglass-shaped richbrown markings outlined in lighter brown; on the sides are triangular upward-pointing dark brown or bluish-purple markings interlaced with chains of brown, yellow and bluish-purple; beneath, yellowish with occasional small blackish spots

The average size of adults is four feet, though specimens up to six feet long have been found in the Eastern highlands. The neck is fairly slender and the stout body tapers sharply to a stubby tail. Females have shorter tails than the males and are stouter.

Found in the Eastern Districts of Rhodesia, it avoids open country and is mainly restricted to rain forest areas where its colour markings blend wonderfully well with the undergrowth. Despite its frightening appearance, it is a most good-natured snake and rarely bites unless trodden on or molested when its warning is the usual hissing of the adder. Though very sluggish it can strike incredibly swiftly and hard. It has an extremely potent venom comprising both blood and nerve toxins, causing death in a short time unless an effective anti-venene is used. A nocturnal snake, it lives mainly on rodents but also eats amphibians and birds, especially of the ground-living type.

Causus rhombeatus—Common or rhombic night adder, nag-

adder, changwa (N), chiva (S).

A snake widely distributed in the wetter regions, particularly

common in open grasslands above 4,000 feet.

It has an obtuse and prominent snout. The head is moderately distinct from the neck and is covered with large shields. In colour it varies from light to dark grey to olive, light to pinkish brown, sometimes uniform but usually with a large dark arrowhead blotch on the back of the head; a series of large, irregularly-shaped, dark brown markings, sometimes light-edged, over back and tail and smaller blotches down the sides; a dark streak on either side of the head behind the eye and lips often dark-edged; beneath dirty white to greyish.

The average length is about two feet.

Mainly nocturnal in habit but sometimes found basking in the early morning or late afternoon sun near heaps of stones, animal holes or termite hills into which it can escape if disturbed. Also often found in or near farm houses, under floors, in rockeries and so on.

It is usually inoffensive, although bad-tempered individuals occur. When really upset the common night adder can be most truculent, coiling up and inflating the body and even flattening the throat cobra-wise, hissing loudly and striking viciously

then, if the intruder moves away, escaping with the head well raised.

Owing to its unwillingness to move out of the way, most bites are due to its being trodden on and are inflicted on feet and ankles. Its venom is haemotoxic but less potent than that of most adders and seldom fatal if first aid measures are taken. A voracious eater of toads and frogs, which it swallows head first.

Causus defilippii—Snouted night adder, changwa (N).

This night adder has very smooth, velvety scales, coloured grey to greyish-green or light to pinkish brown, pale brown or mauve, with a darker spinal stripe and a series of large round, rhomboidal or V-shaped dark markings over back and tail; a well-marked, large, dark, forward-pointing V on the back of the head, a dark streak behind the eye and upper lips darkedged; beneath, yellowish-white, sometimes with scattered, small, greyish-brown spots.

Smaller than the common night adder, it is seldom longer than 15 inches, with a short tail. Distinguished from the common night adder by the upturned tip of the snout, particularly in adults, thicker body and more pronounced dark markings above; decidedly triangular head. Its diet is the same as that of the common night adder, it is more widely distributed and common at low altitudes.

Atractaspis bibroni—Southern burrowing adder or mole viper, Bibron's burrowing or oviparous adder.

The burrowing adder has a projecting snout and a small head passing almost imperceptibly into a slender body covered with smooth closely-fitting scales, and a short tail ending in a spike.

In colour the snake is uniform brown to blackish above, generally with a purplish sheen; beneath it is creamy white to yellowish, sometimes with dark flecking; or brown beneath, the front edges of the scales pale; some specimens are pale below with pale-edged lips. Its eyes are very small and rudimentary and it is very well adapted for a life spent mainly

underground. It seldom exceeds two feet in length and is quite common in Rhodesia, especially in Matabeleland, the Eastern Districts and Kariba.

A most irascible snake, it will bite on the slightest provocation. Due to an underslung lower jaw it has difficulty in striking and often only one fang may pierce the victim's flesh. However, it appears to be able to do this without obviously opening its mouth. Also, due to an unusually flexible neck, it can twist to either side to bite a holder unless very firmly held.

Its poison is mostly neurotoxic but also causes intense local pain and swelling and sometimes local numbness and discoloration. In appearance it is very similar to the harmless burrowing snakes (*Calamelaps*) which may lead to careless handling by the uninitiated. It is usually found in the open only after heavy rains and then only at night when in search of food. When molested, it sometimes raises the forepart of the body, then points its snout to the ground, into which it attempts to burrow.

It preys on a variety of snakes, limbless lizards such as skinks, and young rats and mice.

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